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POPULAR Computing WEEKLY

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29 May-4 June 1986

Vol 5 No 22

£25 million loss rocks Commodore

● **Commodore reports its biggest losses yet**
● **New 64 planned for launch soon**
● **Super-Amiga to follow this year**

Full details below and inside

COMMODORE was last week planning a major push for the 64 in this country following on its announcement of increased losses worldwide in the first quarter of this year. Chris Kaday of Commodore UK said that plans to make the 64 more attractive would be announced "in the next few weeks".

The company is known to be preparing an enhanced version of the 64, redesigned to fit in with the 128, and although Kaday won't talk about the nature of his plans it seems likely that they'll include this. This should give a new lease of life to a machine which, although long in the tooth, continues to be a money-spinner for Commodore.

The financial results themselves are spectacularly bad, with the company showing a pre-tax loss of \$36.7 million (£24.7 million) on sales of \$182.3 million (£121.5 million) worldwide.

Commodore claims that Europe is performing strongly with January to March sales of \$98 million (£65 million) up 53 per cent from \$84 million (£42.7 million) in the same period last year.

Europe is therefore accounting for more than half of Commodore's sales worldwide, and although the company won't disclose profit figures for Europe, chairman Irving Gould has identified the performance of the US operation as disap-

Continued on page 4▶

COLOUR REVIEWS



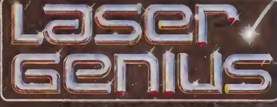
- Shogun – Virgin
- Biggles – Mirrorsoft
- Conquest – Mastertronic
- All in colour – page 16

THIS WEEK'S NEWS

- Mastertronic to go public?
- Storm breaks over US Gold's World Cup Carnival
- MSX 2 arrives – JVC's HC-95

BASIC COMPILERS

What do compilers do, and do you need one? see page 12



AN EDITOR, ASSEMBLER, MONITOR AND ANALYSER THAT REPRESENTS A NEW APPROACH TO MACHINE CODE DEVELOPMENT.

THE EDITOR

THE ASSEMBLER

THE MONITOR

THE ANALYSER





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ABC

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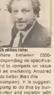
News Desk

Amstrad's £445 PC: the full specifications

AMSTRAD's IBM PC compatible machine, due for launch at next month's Amstrad show is taking shape It will be supplied initially in three versions The basic machine will have monochrome monitor 128K Ram and probably a single disc drive and will cost £399 ex VAT A colour version with 256K Ram and twin drives will be £499 ex VAT while the price of the top end model sporting ten or 20M hard disc and 512K Ram has yet to be fixed

It now also seems likely that the Amstrad PCs will incorporate 5½ inch disc drives and will have full-sized IBM expansion slots This would allow the machines to run the current range of IBM software and to use the full range of IBM and third party expansion cards

A full spec PC compatible from Amstrad would up the ante in the clone battle considerably The cheapest PC clones are currently selling for



Sugar: £25 million richer

somewhere between £500-£1,000 depending on specification, and to compete on value as well as marketing Amstrad has to do better than this

The company it is suggested is going to do this by bundling printer and monitor with the machines and by including an enhanced graphics ability possibly compatible with the IBM Hercules card The machine will be fully compatible but rather than using Microsoft's MSDOS operating system – IBM's PCDOS is a subset of this – will use rival company Digital Research's CP/M 86 or DOS Plus Versions of the machine may also include Gem and a mouse

Amstrad boss Alan Sugar meanwhile has converted 5 000 000 of his shares in the company into an estimated £26-28 million An Amstrad spokesman first observed that normal people could live happily on one percent of the interest on that' and that Sugar wanted the money for his own personal use

Although Amstrad won't say what the money is needed for apart from investment generally' the share offer – which was considerably oversubscribed – could be a sign that further major expansion is in the offing

It does incidentally value Amstrad at over £500 million, and for the first time brings Sugar's shareholding down below 50 per cent Other shareholders are institutional

First to sell budget dBase II

FIRST Software and Publishing has won the UK rights to Ashton-Tate's *dBase II*, the market leading professional database and is to sell it for the Atari ST Amstrad Commodore and Tatung for £119 This represents a considerable reduction on the standard price which can be anything between £250-£500

According to a First spokesman the rights were won against stiff competition from other publishers including Amstrad specialist New Star He predicted brisk sales for the package, which has recently gone down well in both France and Germany Because of the low price Ashton-Tate won't be handling hot-line support This will be dealt with by First for an extra £40 per year

Watford sets up dealer network

BBC mail order specialist Watford Electronics is attempting to broaden its customer base by setting up a dealer network According to its managing director Nazir Jessa the company is moving in this direction because it feels many people are reluctant to purchase via mail order and would therfore be prepared to pay a little extra in order to be able to buy BBC add-ons through their local dealer

Announcing the move Jessa stressed the company's continuing commitment to the BBC micro which he said still had a lot of potential left unexplored

Commodore £25m loss

◄Continued from page 1

pointing It seems likely that he is viewing Europe as the lifeline Commodore needs to achieve its aim to break even in the second quarter of this year

The company claims strong sales of both the 64 and the Amiga in Europe with Kaday reporting the first week's UK shipment of 1 000 Amigas already sold out The phones are buzzing', he claims The company will not however be looking to bring the Amiga down towards mass-market status in the foreseeable future

Amiga. A big brother coming?

The first of the machine's successor expected later in the year, will be a more rather than less powerful version says Kaday He won't give details at present, but Commodore is known to have heeded suggestions that the Amiga's blitter chip could usefully be made to handle larger areas of memory than the current 512K of video Ram

When the machine was first designed this seemed a ludicrously large quantity of memory but the possible applications for the chip are much wider than simply controlling graphics

The blitter allows areas of memory to be shifted around in the machine very fast and therefore each Ram location controlled by it can effectively be viewed as being adjacent to all other locations controlled by it Future developments of the machine could therefore have applications in vector processing A further possible addition would be a 68020 processor, the enhanced version of the Amiga's current 68000

Amstrad software

SOFTSHOP is now offering Amstrad versions of *DR Graph* and *Draw* at £49 50 each, *Sage Stock* and *Invoicing* at £69 99 and *CP+* and *Brainstorm* at £29 95 and £49 99 respectively

The programs can be purchased at Softshop's Amstrad Business Software Centre at 68 Tottenham Court Road London W1, or ordered by telephone on 01-251 0967

The Writer

Our feature on Seltek's The Writer word processor for the Spectrum (May 22nd supplement) contained some slight errors on pricing details To set the record straight, both the 48K and 128K versions come on cassette, and cost £14.95 and £17 95 respectively. Each cassette includes a version of the program which, if you wish, can be customised and transferred to microdrive

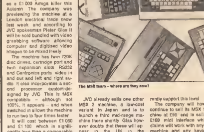
The 48K and 128K cassettes are available now, and the disc version is forthcoming at a price to be announced

JVC aims £1,000 MSX 2 micro at Commodore Amiga market

JVC's MSX 2 machine, the HC95 is likely to be launched as a £1 000 Amiga killer this Autumn The company was previewing the machine at a London electrical trade show last week and according to JVC spokesman Pieter Glas it will be sold bundled with video grabbing software allowing computer and digitised video images to be mixed freely

The machine has twin 720K disc drives, cartridge port and twin expansion slots RS232 and Centronics ports video in and out and left and right audio It also incorporates a second processor custom-designed by JVC This is MSX compatible – although not 100%, it appears – and when switched in allows the machine to run two to four times faster

It will cost between £1 050 and £1 100 which is significantly less than a comparable Amiga system and probably cheaper than anything that could be put together for the ST



The MSX team – where are they now?

JVC already sells one other MSX 2 machine, a low-cost variant in Japan and is to launch a third mid-range machine there shortly Glas however doubts that these will appear in the UK in the foreseeable future his feeling being that the cheapest machine should retail at £250 and that the UK market won t currently support this level

The company will however continue to sell its MSX 1 machine at £99 and is selling a £169 midi interface which it claims will work with any MSX machine and any keyboard Glas feels that attacking specialist markets like these is the way forward for MSX at the moment

The plans of the other MSX companies seem to be considerably less coherent A Mitsubishi spokesman volunteered the information that the company had withdrawn from MSX and when quizzed further said it had withdrawn from MSX in the UK The UK side had he said, considered importing MSX 2 but had decided against this, and was unlikely to do anything else with MSX here unless the machine involved was pretty dramatic

Panasonic whose machines are highly regarded in Japan is in a similar situation although less formally The company currently has no stocks of machines in the UK

Toshiba, MSX market leader in this country has virtually sold out of its HX10 machine and will be selling only its 80K HX22 version at £150 in the near future A spokesman conceded that it was unlikely that Toshiba would be involved in MSX 2 here before 1987

Cup controversy

US GOLD s official World Cup games *World Cup Carnival* appears to be raising hackles in the industry The game is according to US Gold boss Geoff Brown an enchancement of Artic s *World Cup Soccer* game

We ve made it perfectly clear that it is an adaptation with enhancements", he says, and if they [the customers] have purchased *World Cup Soccer* I don t thing they're going to gain a lot' He does however add that distributors should be making it perfectly clear that this is the case

One distributor who did not wish to be named did however tell *Popular Computing Weekly* that dealers were returning large quantities of the game on discovering its ancestry

Popular Computing Weekly has also received a number of phone calls from readers who have bought both versions and weren't warned by their dealers

The message that *World Cup Carnival* is a version of Artic's game therefore doesn t always seem to be getting through especially as there is no warning on US Gold s extensively revamped *World Cup Carnival* packaging

CP/M emulator

ESSEX computer dealer Mike's Computer Store is offering a cleaned up version of Atari's CP/M emulator for the ST at £6 50 including post packing and VAT The package which was produced by former Atari employee Mike Wilding, includes one CP/M emulator disc, a utility disc incorporating public domain software, and a 14 page manual Wilding points out that the latter overcomes the usual Atari problem of having the instructions for using the disc filed as a document – on the disc

The emulator also has the German documentation supplied by Atari placed in its own folder on the disc and the English text corrected

Unitsoft is sunk

GLASGOW-BASED mail order discount company Unitsoft has ceased trading leaving a large number of customers with their cheques cashed but with no software

Popular Computing Weekly has already been contacted by a number of readers who are owed money by Unitsoft, and as the company crashed after mounting a heavy advertising campaign in the computer press it's likely that many more people have been caught out

As Unitsoft was not a limited company, the settlement of debts is the responsibility of the two partners

Accountant John Hendry and Co is currently going through Unitsoft s books to establish the extent of the liability

It looks as though there s about £80 000 owing said John Hendry himself The assets of the individuals involved don t seem too good But we will be writing to all the creditors

John Hendry and Co can be contacted out 3 Lynedoch Street, Glasgow, Scotland

News Desk

Mastertronic plans a share flotation

MASTERTRONIC is planning a share flotation to finance a major capitalisation programme' next year A spokesman said it wasn't yet certain whether or not the flotation would take the form of an offer of a minority stake in the company or whether it would be sold off completely He did predict, however that Mastertronic would be looking at an exceedingly good punt.'

The nature of the expansion the company wishes to finance, and hence the sum of money required is dependent on the success of its new US operation This the spokesman said was moving steadily but not astonishingly The company's expansion plans encompass the computer market, but are also likely to include low price mass marketing of other, non-computer, products

'Mastertronic came in for a lot of flak when it launched ' said the spokesman but it has demonstrated spectacularly that given the right product at the right price, there's a huge market out there ''

OCP goes into liquidation

SOFTWARE publisher Oxford Computer Publishing has gone into liquidation According to OCP's boss, Bill Richardson, the company suffered badly when French distributor Direco went down and has experienced further difficulties in obtaining money from a number of outlets on the continent which accounted for a great deal of its business

This coupled with the difficulties it encountered in getting serious software distributed in this country meant that it couldn't continue without further finance The creditors meeting is scheduled for this week and although Richardson hopes to be able to find a buyer for the company and its stock no offers have so far been forthcoming

Eprom programmer

NEXUS Technical Services has launched an Eprom development system for the Atari ST The system's hardware plugs into the ST's cartridge port leaving DMA and serial ports free for expansion and has two Zip sockets for programming and reading Eproms, an external simulation socket and an expansion socket

The ST's Gem-based operating system has also been incorporated allowing for example data to be transferred from disc to Ram Internal simulation also allows the ST to run either simulation Ram or Eproms

Details from Nexus Technical Services, 38 Melrose Avenue Reading RG6 2BN (0734 864559)

Amstrad languages

PROSPERO Software, which recently released its *Pro Pascal* and *Pro Fortran* compilers on the Atari ST has transferred the two id the Amstrad PCW 8256 The two products cost £75 each They are now available on Z80 8086 and 68000 based micros

Details from Prospero Software 190 Castlenau London SW13 9DH (01-741 8531)

Diary Dates

MAY

31 May
Dragon Computer Show
Ossett Town Hall Yorkshire
Details: Hardware and software support for the Dragon.
Organiser John Penn, 04203 5970

JUNE

10-12 June
Comdex International in Europe
Nice France
Details Business exhibition covering computers, printers, peripherals and software. Trade only
Organiser Interface Group, 01-734 7282.

13-15 June
The Amstrad Computer Show
Novotel, London
Details: Hardware, software and peripherals for Amstrad micros
Price: £3 adults, £2 children, £1 discount for advance sales.
Organiser Database Publications, 061-456 8383

24-26 June
Computer '86
G-Mex Exhibition Centre, Manchester
Details. Business and industry computer show formerly known as the Northern Computer Show
Price Free entry by business registration.
Organiser: Reed Exhibitions, 01-643 8040

JULY

16-18 July
PC User Show
Olympia, London
Details: Hardware and software for IBM machines and their compatibles.
Organiser EMAP 01-606 1181

24-27 July
Acorn User Exhibition
Barbican Centre, London
Details: Hardware software and peripherals for the Electron, BBC micro and Master machines Trade only 10am 1pm on 24 July
Price £3 adults, £2 children, £1 discount for advance sales
Organiser Editionscheme, 01 349 4667

SEPTEMBER

3-7 September
Personal Computer World Show
Olympia, London
Details: Software and hardware for home, educational and business computer users.
Price: £2
Organiser Montbuild 01-487 5831

13-14 September
Commodore Horizons Show
UMIST Manchester
Details: Commodore hardware, software and peripherals.
Price: £3 adults £2 children, £1 discount for advance booking.
Organiser Database Publications 061 456 8383.

26-28 September
Electron and BBC Micro User Show
Details: Software hardware and peripherals for the Electron, BBC micro and Master machines.
Price £3 adults £2 children £1 discount for advance booking
Organiser Database Publications 061 456 8383

Prices, dates and venues of shows can vary and you are therefore strongly advised to check with the show organiser before attending *Popular Computing Weekly* cannot accept responsibility for any alterations to show arrangements made by the organiser

Letters

Popular buggy

A friend of mine told me that some time ago you printed an article on computer buggies. As I have only recently been introduced to computing, I missed this article and would like to know if you or any of your readers can help me. I own a Commodore 64.

I have another query. How do you take a photo of a television screen? I have had a few attempts at taking screen shots of my favourite games but without success.

Asmat Ullah
5 Napiershall St
Glasgow

This article was printed in the March 14-20, 1985 issue. Back numbers of *Popular* are available from the address and phone number at the front of the magazine.

Taking screen shots: turn all the lights off in the room (best to take pictures in the evening), use a tripod, set the exposure to one eighth of a second, put the aperture to between f4 and f8, take the picture and keep your fingers crossed . .

Clever feature

In response to your news item regarding the virtual standstill of 128K Spectrum software, I was disappointed but not surprised to hear this. 128K only software seems to be limited so far to the excellent *Knight Tyme* from Mastertronic. However, there is still some *good* things to look forward to.

Ocean's *Batman* contains a very clever feature which detects which machine it's being loaded on and produces the relevant sound effects. Whilst this obviously does not warrant buying a 128K, it is an idea which more software houses should include as standard, saving them from having to produce a separate 128K version.

It was obvious that stories of gloom and doom might follow the Amstrad take-over but speaking personally the option between versions of a game is something 48K owners do not have a choice over.

Richard Hewison
Lower Woodside
Luton
Beds

Dinky footwork

In answer to all those who took exception to my comments about *Movie* (Letters March 13) let me go on to talk about *Batman*.

The graphics in *Batman* appear to be based on the same technology but this time they add so much to the game by allowing *Batman* to manipulate the furniture to some purpose.

The atmosphere in *Batman* is delightful and the graphics so clear that the game is eminently replayable.

Suffice to say *Batman* is terrific and I find that I do not even mind his footsteps. They are so much in character with his dinky footwork.

Hugh T Walker
Burpham
Surrey

Star Letter

Toolbox routines

I liked the recent series of toolbox routines for the Spectrum, written by Paul Murray but I felt these utilities had one disadvantage: the output from the *Trace* and *Dump* routines could only be sent to the screen or a ZX printer, not to a 'full-size' printer.

These routines can be modified to send output to the printer, or any other output device quite simply.

The *Dump* routine is the easier, and it does not require any Pokes ie the machine code is not changed.

First of all type

OPEN #2 channel

where channel is the name of the output device. For example if you wanted to send output to a printer through the interface one RS232 port you would use *Open #2 "T"*.

Once finished, the command

OPEN #2, S

returns the screen to normal use. This method can also be used to redirect output from the header routine.

The *Trace* routine is more difficult. This is because the channel attached to stream 2 cannot be altered, without the program doing some weird things. Therefore a new stream must be used. The command

OPEN # stream channel

can be used where stream is the output (4-15) and channel the name of the output device. The value of stream would be poked into address 62387. Now when the *Trace* routine is run it will send output to the specified device eg an 80-column printer.

Chester Gillon
Colchester

A year's supply of Popular binders goes to Chester Gillon

Balanced view

We were intrigued by Peter Worlock's review of our *Pascal80* product for the Amstrad disc-based machines (May 15) as it contains a number of factual errors and some highly contentious statements.

Firstly, the product is called *Pascal80* and it runs on any Amstrad machine with a disc drive (ie the CPC464 with DDI-1, the CPC664, CPC6128, PCW8256 and PCW8512). It requires CP/M 2.2 *or* CP/M Plus with a minimum TPA size of 30K.

The GSX library routines are supplied free of charge so that owners of Amstrad machines which are supplied with GSX can write programs which access this graphics interface. GSX is supplied by Amstrad on its CPC6128, PCW8256 and PCW8512 machines. For own-

continued on page 10 ▶

Puzzle

Puzzle No 210

My nephew has a number of identical cubical toy building blocks which he keeps in a larger plywood box which is exactly cubical. When full, this box will house all but one of the blocks.

The other day he was laying out right-angled triangles such as the one shown below.

As you can see, this uses just 12 of the blocks as the triangle has sides of three, four and five units. Curiously, if he were to use all of his blocks he would have just enough to build a much larger triangle.

What is the smallest number of blocks that he could have in his collection which would allow him to do this?

Solution to Puzzle 205

The amount that Luigi withdrew each week was 10 799 lire. Each day for seven days an amount equal to 8/365000ths of the amount in the account at that time is added to the total sum. At the end of this time a cash withdrawal is made. This is repeated 52 times, after which the amount in the account amounts to 500 010 lire.

In order to find the amount which has to be withdrawn each week, an approximate value (R) is introduced into the program at line 10. The necessary yearly computations are then carried out using this value and the resulting residue is compared with the target figure of 500010. Depending on this result, the original value of

```
 10 R=1000
 20 CAP=1000000
 30 FOR WEEK=1 TO 52
 40 FOR DAY=1 TO 7
 50 CAP=CAP+(CAP*8/365000)
 60 CAP=INT(CAP+.5)
 70 NEXT DAY
 80 CAP=CAP-R
 90 NEXT WEEK
100 PRINT CAP,R
110 IF CAP=500010 THEN STOP
120 R=INT(R*(CAP/500010))
130 GOTO 20
```

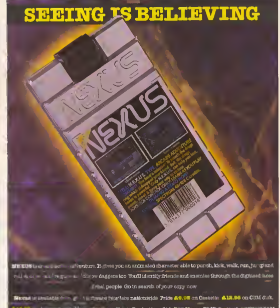
R is adjusted by an appropriate proportion in line 120. Each successive approximation is printed out until the required value is arrived at when execution of the program stops.

Winner of Puzzle No 205

This week, no one managed to arrive at the correct answers, so there is no winner.

Rules

The closing date for puzzle 210 is 24 June.



ON COMMODORE 64/128 NOW! Coming soon on Amstrad and Spectrum.
SEEING IS BELIEVING
NEXUS
It gives you an animated character able to punch, kick, walk, run,
daggers too. You'll identify friends and enemies through the digitised faces
people. Go in search of your copy now
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Productions Ltd., DSB House, 30 High Street, BECKENHAM,
Cheques only payable to Nexus Productions Ltd.

Letters

◄ continued from page 8

ers of Amstrad CP/M 2 2 machines graphics support is provided through a turtle graphics package using *firmware* calls A turtle graphics package using GSX calls also is provided for those machines supporting GSX The turtle graphics packages are supplied as Pascal source programs containing procedures functions and declarations enabling programmers to create turtle graphics applications in compiled Pascal – it is *not* a turtle graphics interpreter

The documentation provided with *Pascal80* contains a complete definition of the language syntax accepted by the compiler, using syntax diagrams to make it easy to follow A number of example programs are provided on the disc (*Dis Pas* is a semi-intelligent Z80 disassembler for example and *Birthday Pas* demonstrates the use of random-access filing techniques) and in the manual, so we feel that the documentation is more than adequate

For those who know nothing of Pascal or similar block-structured high level languages then yes a tutorial book will be required We mention a few suitable ones in the bibliography in the manual

Is this an action replay of Artic s World Cup?

We would like to question Peter s assertion that Digital Research s Pascal/MT + is "the natural choice for computing students" as it is not an ISO-standard compiler Prospero Pascal which Peter didn t mention *is* an ISO compiler, is nearly as fast as our *Pascal80* and is not that much more expensive on the Amstrad

Although we would agree that Borland's Turbo Pascal is fast it is not as fast as *Pascal80* and we disagree that it is the one for real language buffs as even Borland admits that it is far from being ISO-standard

We would like to point out with deference to Peter that HiSoft s *Pascal80* does seem really to have the edge over the other Pascal compilers on both performance and code size On price, of course we are unbeatable

As Peter s review seems to us unbalanced, we think that publishing this letter in your magazine would help to redress the balance

Hi Soft
Dunstable
Beds

Peter Worlock replies The name Pascal 180 was a printers' error I said it ran on any Amstrad machine, I said it supported GSX, I said there were demo programs; we agree a tutorial may be needed

The turtle graphics business was my mistake, for which I apologise As to the various implementations, I think this is a matter of opinion I wasn't aware that Prospero s *Pro Pascal* was available for the Amstrads, of the packages I mentioned none is ISO-standard and I wasn't able to benchtest them I will take your word that *Pascal80* is the fastest, but I stick by recommendation of *Turbo Pascal* on the strength of the number of support packages available and the enormous user-base

Star letters

Every week *Popular Computing Weekly* offers prizes for Star letters The most intelligent, pertinent, helpful, or simply interesting item in our postbag each week will win the writer a free year's supply of exclusive *Popular Computing Weekly* binders

Here is your chance to clear up that pile of old *Populars* under the bed and file them neatly, so get writing today

Send your thoughts to Letters, *Popular Computing Weekly*, 12-13 Little Newport Street London WC2H 7PP



CentreSoft presents
Office Master
48K and 128K
With over four years experience of providing practical software solutions for business and home applications, Gemini have put together their entire range of famous titles for the Spectrum and Spectrum Plus in ONE special pack, at a VERY SPECIAL price. Whether you're a cassette or microdrive user this super value pack contains all the serious application software you're ever likely to need for your Spectrum from home accounts and database management to a complete professional business accounting system.
Gemini's OFFICE MASTER is here—put that computer to WORK!
• Database
• Stock Control
• Final Accounts
• Easiledger
• Mailist
• Cash Book
• Home Accounts
• Graph Plot
Each pack contains ALL 8 programs demonstration data files, and clear and comprehensive manuals for EACH program. Gemini's previous retail price for all these programs individually was £179.60
Now they're all together in ONE COMPREHENSIVE PROGRAM PACK
OFFICE MASTER
Tape £15 Microdrive £17.50
includes P&P and VAT
Database
Use this program for storing all types of information just the way YOU want to store it. You set up a computerised 'card index' system and add records and data to the file in the format that you choose. Advanced features include sorting and searching for specific records, mathematical calculations, printer routines, data summaries, etc. If you don't have a database you certainly should!
Mailist
This is a specially designed database for storing names and addresses, and printing out in label format. Special search routines are included for selecting only names and addresses that conform to your criteria. The famous Gemini 'Searchkey' facility is included with this program, and data entry is simplified by an on screen label painting system. Just type in those names and addresses as though you were using a typewriter!
Stock Control
One of Gemini's specialty programs, this software will take the drudgery out of keeping stock records. Enter details of part number, description, unit quantity, cost price, selling price, minimum stock level, units in stock, order quantity and supplier details. Detailed reports include totals of stock at cost and sale price, cost of bringing stock up to level specified, gross margin, understocked items, etc. Full browsing facilities to make inventory management a pleasure!
Cash Book
This is a full and comprehensive cash book accounts system designed to REPLACE your manual ledger entirely. It will take you from the 'shoebox' situation of sheaves of invoices, cheque book stubs, petty cash vouchers and bank statements etc. to a properly constructed trial balance. You may then use your FINAL ACCOUNTS package and produce profit and loss account and balance sheet ready for audit. A REAL money saver when it comes to your accountancy bill!
Final Accounts
Using the data file on microdrive or cassette prepared by the cash book program this software will produce comprehensive end of year reports ready for audit by your professional adviser. The Gemini cash book and final accounts system is now in use by many thousands of businesses and as a classic professional program has been translated for a wide variety of micros. Cash book and final accounts alone warrant the purchase of the OFFICE MASTER program pack.
Home Accounts
Designed as a complete financial and budgeting package for home affairs this program allows the user to set up a budget for items of household and family expenditure and compare actual expenditure with budget as often as required. A running total of surpluses and deficits is available both numerically and in bar graph form. A complete bank account routine is included together with suggested expenditure categories which may be simply altered as required.
Easiledger
Consists of invaluable routines to allow the creation of any type of financial ledger system. Its usefulness lies in its ability to produce account balances instantly for debtors and creditors together with an audit trail of all entered transactions, with dates and references. A year-to-date summary is included of sales, purchases, receipts and payments over a 12 month period, and most importantly a completely interactive bank account database is featured.
Graph Plot
At last superb graphs, bar charts and pie charts on your Spectrum! With a complete data entry section and the ability to load and save files this is really one of the fun programs to use. Represent numbers and data in clear diagrams with this package, and print them out on your printer to accompany reports, budgets, etc. Very highly recommended for the office, home and school. Also includes capability to provide mathematical function plotting.
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Compilers – an overview

Professional programmer David Ridge reveals all about Basic compilers, their advantages and limitations, with particular reference to the Spectrum

Picture the scene friends are enthralled as you explain the dazzling details of your latest program. You're telling them about the climactic ending where mutant teddy bears armed with wooden spatulas overthrow the Thatcher government when someone asks, "What's it written in?" Noticeably shaken and with a quiver in your voice, you mutter almost inaudibly, "Basic". Your friends begin to look at you with that special gaze they usually reserve for an unrecognisable plate of food.

Is this scene familiar? For most people who dabble in programming the Spectrum Basic is the most common medium used. However, after some programming most people find themselves using a few creative adverbs when describing the slow execution speed of Spectrum Basic.

In the last year or so there has been a proliferation of Basic compilers. A Basic compiler in the most general terms, will turn a Basic program into machine code. More accurately most Basic compilers create a strange brew of calls to run-time routines interwoven with proper machine code. Clear as mud isn't it?

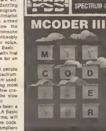
The Spectrum, like most computers has a built-in set of instructions on the Rom chip. These Rom instructions are the brain of the computer enabling it to know what to do when you push a key or enter a command. The Rom is made up of many individual routines which can be called to do their thing. Machine code programs generally contains many such Rom calls.

Mixture of calls

Compilers tend to do things a little differently. Most compilers have a number of built in routines usually referred to as the "Run time package". These run-time routines are instructions which are called by the compiled code instead of the Rom routines. The code produced by some compilers will be a mixture of calls to Rom routines and run-time routines. Other compilers may use either their own run-time routines or the Rom exclusively.

You may well ask why the compiler doesn't call only Rom routines since, after all the Rom routines are in machine code. The answer is that run-time routines are generally used to increase execution speed. A good example is the *Circle* routine in the Spectrum Rom, it is painfully slow. If the Rom was used there would be no increase in drawing speed because the Rom routine is already in machine code!

It's not that Sinclair doesn't know how to make a fast circle routine. Due to memory restraints, compact code is a higher priority than execution speed. That's why for example *MCoder III*, one of the more



recent Basic compilers draws a circle many times faster than the Rom. It is using its own run-time routine.

So what about the compilers that use the Rom exclusively? How do they give a speed increase? The main reason Basic runs slowly is because it is an "interpreted language". The computer doesn't understand Basic, it only understands the binary bliss of ones and zeros known as machine code. So when you run a Basic program, the interpreter is constantly changing the Basic into machine code at run time, a very slow process! The compiler eliminates this step by changing the Basic into machine code before it is executed.

So you can see that even if a compiler uses the Rom routines exclusively tremendous increases in speed can still be achieved because the interpreter is bypassed. These concepts are generally true for all compilers whether you are compiling Basic, Pascal, C or whatever.

Speed increase

In that case it seems a bother to learn machine code when a Basic compiler will do it for you, but the two main reasons are the tremendous bulk of the compiled code and the resulting slower execution speed. A computer can't be expected to create machine code as efficiently elegantly and logically as an expert.

The most often asked question about Basic compilers is "How much of a speed increase can be expected?" That depends on whether you use a "floating point" compiler or an integer compiler. The floating point compiler will compile Basic containing any floating point operations such as *Sin*, *Cos* or any operation using real (decimal) numbers. The integer compiler will not.

The code produced by a floating point Basic compiler will always run much slower than that produced by an integer compiler. But even so in a case where you want to compile some Basic containing some floating point operations, the fastest integer compiler in the world won't help you at all!

General rules

Usually the advertisements for these compilers will not mention whether the compiler in question is of the floating point or the integer variety. A good general rule is: if the advertisement says that the compiler will handle *all* Basic commands, then it is a floating point compiler.

The speed increase you can expect will vary wildly depending on the compiler you are using, the Basic operations you are compiling, and the structure of the Basic. However I would offer these estimates: a floating point compiler will generally yield a speed increase of one to 10 times that of Basic with an average increase of approximately four times. An integer compiler will usually yield an increase of 20 to 120 times that of Basic with an average increase of approximately 50 times.

Now don't let these fantastic quotes for integer compilers sway you too much. Because integer compilers don't handle all of the Basic your Spectrum can produce there are many restrictions involved with their use. These restrictions will vary from one compiler to another but generally they will not handle *any* operation using real numbers, any complicated string manipulation or multi-dimensioned arrays. You may find that for some programs the restrictions imposed by the integer compiler make it useless. On the other hand you may find the relatively poor speed increases yielded by the floating point compilers make them worthless!

BUT! There are many situations where a speed increase of four or five times can mean the difference between an irritating jerking screen display and a smooth, fast and professional looking result. If you're can get away with using an integer compiler, the results can be spectacular! You can't really appreciate what it means to speed a program up by 40 to 50 times until you've seen it with your own eyes.

It is possible to use a Basic compiler as a professional development tool on the Spectrum although one very serious drawback of Basic compilers is the size of the code they produce. I would estimate

programmer

Further these compilers either append a large portion of code to the compiled code or they must have the compiler present for the compiled code to run. Most Basic compilers take up between 4K and 6K of Ram. Supoose you're compiling a 1K Basic program. Typically the compiled code will be around the same size as the Basic code, about 1K in this case. Now add the 4K to 6K for the compiler and your 1K of Basic has grown to 7K at run-time. It becomes less of a concern with larger programs. Another 4K on the end of 25K of code doesn't sound so bad.

As a professional programmer concerned with rapid development time I am very interested in the potential of a good Basic compiler. To this end I have purchased and experimented with a number of Basic compilers. I would say that the speed achieved is perfectly acceptable for commercial program development but the size of the code is not.

Which compiler?

Which compiler to buy? A very tough question to answer. I have extensive experience with the following floating point compilers: *MCoder III* by PSS, and *FP Compiler* (which has just been relaunched) by Softek and for integer compilers *Colt* by Hisoft and *MCoder II* by PSS.

If you want to be prepared for all possible situations you will need both a floating point and an integer compiler. I should point out that an advanced Basic programmer will be able to find many ways around the restrictions of an integer compiler. A novice may have to settle for the ease of use and meagre speed increases offered by the floating point variety.

My experience indicates that Basic compilers which handle the *least* number of Spectrum Basic commands yield the fastest and most compact results. I know it's dangerous to come up with sweeping, general statements but here goes: *the more work required to get the compiler to compile, the faster and more compact the compiled code is likely to be.*

If you use a floating point compiler chances are you won't have to change your Basic listing at all and the results can be a little disappointing. If you can use an integer compiler you may end up modifying your original Basic listing a great deal, but the results will be worth it.

As for which one to buy, they all have advantages and disadvantages. I should point out that *Colt* by Hisoft is an enhanced version of *MCoder II* so if you're considering an integer compiler you might just as well choose *Colt*. *MCoder III* however is a whole new ball game.

It's difficult to make a recommendation in the floating point category. I found *MCoder III* to be simple to use and compatible with nearly all Spectrum Basic commands, but it lacks the kind of documentation that a programmer needs. I'm not saying that it has poor documentation. It virtually has none at all and needs none because it's so easy to use. The problem is that there is no information given about the size of the compiled code or even its location. The insert doesn't even say how large a program you can compile!

The *FP Compiler* by Softek doesn't handle as many Basic commands as *MCoder III* but it does give all the necessary information a programmer would want and the documentation is fair by Spectrum standards. I compiled many small test programs using both *MCoder III* and *FP Compiler*. The programs compiled using *MCoder III* ran consistently faster than those using *FP Compiler*. The difference was generally in the area of 10% to 30%. On the other hand the *FP Compiler* can be easily transferred to and used from microdrive. *MCoder III* cannot be used from microdrive but the compiled code can be saved to microdrive.

***MCoder II* (£9.95) and *MCoder III* (£12.95) are available from PSS, at 452 Stoney Stanton Road, Coventry CV6 5DG; *FP Compiler* (£5.95) from Softek at 12-14 Henrietta Street, London WC2; *Colt* (£12.95) from Hi-Soft, 180 High Street, Dunstable, Beds, and *Laser Basic Compiler* (£19.95) from Ocean IQ, 6 Central Street, Manchester.**

Money planner

Office Mate from Gemini is new on the Commodore 64, although other versions have been around for a while. The package, on tape or disc, offers a database, home accounts, Maillist and word processor. Not bad for £12-£15.

The title is rather misleading in some respects. The accounts program, for instance, is strictly for domestic finances, more a Home Mate than an Office Mate.

The database is a simple and quite flexible little program. You can design your records pretty much from scratch, with up to 20 fields in each and 76 characters per filed, so you don't have to use easily forgettable abbreviations. Fundamental search and sort facilities are there, plus printer dump and calculating options on your collected data.

I am always a little wary of home accounts packages. If you're meticulous you probably keep pretty good accounts filed on paper. If you're lazy about financial planning, then you're likely to be lazy about loading up an accounts program and updating it regularly. Luckily this one doesn't expect you to key in every Mars Bar you buy: it's essentially a month-by-month planner and budgeteer. It's clearly laid out, with easy to follow menus, and not too many confusing sub-menus.

The Maillist is also simple, and quite strictly defined in its names and addresses format.

The word processor is basic but functional – something to do a club newsletter on rather than a professional report. As ever, there are the usual ingenious fudges to get around the Commodore's 40-column display and the printer's 80-column output; in this case, each single line on the print-out appears in a different colour on-screen. Word wrap, right justification option, block delete, word counts etc, are included on separate menus.

As a package its simplicity and ease of use are applaudable, particularly for the price, and the accompanying manuals are also extremely clearly written. The essential features are all there, but don't expect any mind-blowingly sophisticated features ... and I still think it should have been called Home Mate – Gemini's companion package *Office Master* deals further with business-style utilities.

Christine Erskine

Program *Office Mate* **Micro** Commodore 64 **Price** £19 (tape) £15 (disc) **Supplier** Gemini Marketing, Gemini House, Dinan Way Trading Estate, Exmouth EX8 4RS

A quality product

In the beginning databases for home micros were little better than simple card files. Still, as the power of the machines has increased so has, in general, the usefulness and quality of the product – enter please *TRIM* on the ST from Talent.

You'd expect a disc-based system running under Gem to be good, but there's more to *TRIM* than nice graphics and mouse control.

For starters the documentation takes you through file creation and data entry step by step – you set up various fields (Talent calls these variables) and define field types and lengths, but unlike other less flexible databases these can be altered after data entry has started.

However, the best point about *TRIM* is the way you can question the database and extract information from it in the form of reports. The report generation turns the database into an intelligent mail merge of considerable potential power.

Like most good things, I suspect you would have to put in a fair amount of thought to get the most out of this program – but its comprehensive handbook and user-friendliness should guide you well.

John Cook

Program *TRIM (Talent Relational Information Management)* **Micro** Atari ST **Price** £89.95 **Supplier** Talent Computer Systems, Curran Building, 101 St James Road, Glasgow G4 0NS.

Business users

Generic terms, as Ariolasoft and Batteries Included seem to have found, aren't always the best way to sell a product. One of the latest efforts from the duo (produced by the latter, published by the former) *Cal-Kit*, is billed as "the complete problem solving software package".

No more messy bank statements, income tax returns and so on – it sounds like a dream, but it doesn't sound like what it is. Yes, that's right. It's a spreadsheet.

The publisher's reticence as regards the dreaded word – extending to references to "worksheet" throughout – is understandable. Spreadsheets can certainly be configured so that they do sterling service vis a vis bank statements et al, but this all too often means the user has to commit a considerable amount of time and effort to producing models. The spreadsheet therefore tends to have unfavourable associations for home users.

But fortunately there's more to *Cal-Kit* than just a name change. As I've said, the effort involved in designing models is one of the major problems of spreadsheets, and Batteries Included has taken the obvious step of including a series of ready built models with *Cal-Kit*. There are a considerable number of these, ranging from the fairly obvious *Home budget* to the decidedly esoteric *Canning calc*.

The latter is a product of the fevered imagination of the forms designers round at Batteries Included, and you will find it "extremely convenient" if you do your own canning and freezing. Ho hum.

Nevertheless, the likes of this can no doubt be modified to apply to non tuna-related practices, and several of the other models should be right up the street of the home user with a bent to business, dealing as they do with electricity and installment payments, bank statements, heating and – nice touch this – business start-up.

The program itself is fairly easy to use and, of course, allows you to design your own forms. The spreadsheet (sorry, worksheet) handles 99 rows by 26 columns, and includes a help-screen and a range of logical maths functions.

Personally, I'm not as convinced as the software houses are that there's a real demand for "home productivity" software, but as there's no profit for them in selling pencils and backs of old envelopes you've got to give them credit for trying. And *Cal-Kit* in this sense is a fine effort. It's neat, effective, easy to understand, and good value for money. It should do well with small business users, and if you want to get that home canning business going it could be just what you need.

John Lettice

Program *Cal-Kit* **Micro** Commodore 64/128 **Price** £39.95 (disc) **Supplier** Ariolasoft, Long Acre, London WC2



DO YOU WANT TO BE A HERO?
Biggles
The result of unique co-operation between three ace software developers and the Biggles film production company, Biggles – The Untold Story will knock you right out of the air! It's a multi-part arcade strategy game in which each part must be completed to reach your final goal.
In the air, on the rooftops, on the ground, or in the trenches
YOU CAN BE A HERO!
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Tebbit goes east

Remember Shogun? The mega TV epic of a year or so ago? The one where Richard Chamberlain was washed up in mediaeval Japan and the locals wandered about saying incomprehensible things?

Well Virgin has now created *Shogun* the computer game. In this version the locals wander about doing incomprehensible things.

It has to be said that the game is only loosely based on the book/TV series. You take the part of any of 40 or so characters with the aim of becoming Shogun – a sort of oriental Norman Tebbit.

To succeed you must pursuade 20 of the other characters that you're the one for the job. You do this by befriending/bribing/threatening people you meet, and if all that fails you can try to kill them.

All of this sounds like the makings of a first-class strategy game but sadly Virgin has rather blown it in the execution. *Shogun* plays too much like *Sorcery* with (admittedly nice) graphic characters wandering about the screen. When you meet someone, you can take a number of icon-driven actions including the said bribery/befriending etc.

One catch is that it's all too abstract. Apparently levitation was commonplace in ancient Japan – if you need to get to the top of the mountain you simply levitate straight up for half a dozen screens. Sometimes you can walk through walls, other times you need to fly over the house.

The other major drawback is that for most of the time you haven't a clue what's going on. All of the other characters wander about doing their own thing and your only means of keeping track of the action is a single-line newspaper that informs you of events like "Toranaga orders Kiku" and "Pine takes a helmet near the village".

You're told only how many followers you have and you'll find yourself watching the display in bemusement as your band increases and decreases apparently at random. Some kind of information screen showing the state of your major rivals etc would have helped enormously.

It's not that *Shogun* is a bad game, because it isn't. The graphics are well done and the soundtrack sets the scene perfectly. It's rather that it could have been one of the all-time classic strategy games and ends up being an average arcade offering.

Check it out for yourselves – some of you will love it, but I suspect that many will share my disappointment.

Peter Worlock

Program *Shogun* **Micro** Amstrad CPC, Commodore 64 **Price** £9.95 **Supplier** Virgin Games, 2 Vernon Yard, Portobello Road, London W11

Ghoul infestation

Derek Brewster is well known as the adventure columnist of a monthly magazine so it should be no surprise that when he writes an arcade game it has heavy adventure overtones.

Our pre-production copy of *Conquest* was so hot off the press it was also pre-inlay so I can't tell you much about the plot, except that it sets your tiny hero the task of running round a vast multi-room castle which is infested by as ugly a collection of ghouls as ever howled in the night!

The first thing to find is the axe, which returns boomerang style when thrown and seems to be efficient against 99% of all known nasties.

Let a snake sink his fangs into you and you'd better get a suitable potion quickly or it's fangs for the memory.

The game uses a rather odd control system. The four joystick directions control movement but there are two other pairs of keys to select one of five objects carried and to select an action icon.

Graphically the game is somewhat spartan looking with its high vantage point 3D rooms. It's a clever idea but I couldn't help feeling it was more suited to the standard range than competing with MAD games.

John Minson

Program *Conquest* **Micro** Spectrum 48K **Price** £2.99 **Supplier** Mastertronic MAD Games

Looping the loop

I've always thought Biggles had great computer game potential – Sopwith Camel flight simulation, text adventures (Go north. Say to Von Stalhein "You cad", then stiffen upper lip) arcade action in the shoot-outs or aerial dogfights.

Now it's happened and there is of course a catch. The game is based on the film not the books and since the film is a travesty of everything true Biggles fans hold dear, Mirrorsoft has a tough job.

Biggles is actually two games – *Timewarp* and *The Sound Weapon* on either side of the tape. Completing the second is easier if you have already completed the first but not impossible.

Timewarp is a fairly straightforward arcade game, with a nice touch which links it to the film. There are three scenarios: flying through the air shooting everything, moving through the battlefield shooting everything and chasing around the rooftops dodging everything. The first two are set in 1917 during the war, the third is set in 1986.

As in the film you are transported from one year to another with very little warning – just a thunderflash appearing on screen to tell you that the time warp is taking effect.

Having completed *Timewarp* (or not, as the case might be) you can move on to *Sound Weapon* where the emphasis is partly on flight simulation (in a helicopter with your time travel companion, thoroughly modern Jim) and partly on a more conventional arcade adventure scenario.

As a flight simulator, it's not going to give anyone at Sublogic sleepless nights, but that's not the point and it is quite fun. But the thought of Biggles travelling through time in a helicopter is giving me sleepless nights and Captain W E Johns and Biggles himself will be looping the loop in their graves.

Christina Erskine

Program *Biggles* **Micro** Commodore 64 **Price** £9.95 **Supplier** Mirrorsoft, Maxwell House, Worship Street, London EC2.

The holiness of an atheist . . .

The meaning of Stonehenge has puzzled some of the world's finest minds But now we have the solution – it was built to provide a scenario for Ariolasoft's latest game

The Standing Stones written by Electronic Arts actually takes place beneath Stonehenge in a sort of Arthurian setting The ultimate goal of your quest is the Holy Grail although you should keep an eye open for Excalibur and some charmed armour along the way

So taketh up thy sword and prepareth to entereth the bowelth of earth

The documentation is written in thith sort of style and it's very funny in places Of a sample character it says He hath the holiness of an atheist and though he be fleet of foot he clearly suffereth from advanced leprosy Choose thou not such a loser!

You start by creating a knight preferably with reasonable strength in all departments Intelligence and holiness govern spellcasting ability, strength, agility and hit points determine how well you will perform in combat

Then down in the dungeon something stirreth In you go treading the maze depicted in 3D perspective graphics On the way you'll encounter monsters, a few of whom are friendly but most of whom will attempt to rip out your throat

Sirtech's *Wizardry* is the classic of this genre and comparisons are inevitable In the early stages, it must be said *The Standing Stones* does not quite reach the elevated levels of *Wizardry* but the documentation hints at better things on the lower levels I lacked the nerve (and the hit points) to venture down that far

One of the delights in store is leisure time at the oasis where you can trade buy food bet on the cockroach races, and leave messages for friendly characters

At £14 95 for a disc-based game, it's not overpriced and you're guaranteed hours if not weeks, of play Well worth trying if you're a fan of the genre

Peter Worlock

Program *The Standing Stones* **Machine** Commodore 64 (128 compatible) **price** £14 95 disc only **Supplier** Ariolasoft 68 Long Acre London WC2E 9JH

Bureaucratic tasks

Strategy and combat specialists Black Knight are back on the warpath with a tale of land management and mis-management in medieval times The King has allocated a remote territory to you which as a job is second only to cleaner of the royal piranha's teeth!

Not that you're being rushed You have all of 200 years to raise 1 000 groats and placate his majesty In this case I think I'd rather get the Abbey Habit and go for long term investment Apparently that option's not open to medieval nobles though so it's gather your knights together to exploit the peasantry

Actually *Sword and Shield* is a considerable advance on the old-style land management game when you just had to allocate resources There's a wargame element to this which has totally avoided using a grid Instead you issue orders to your troops sending them off at a specified speed in one of eight directions

When one of your knights comes into contact with the enemy the inevitable battle ensues unless you decide discretion is the better part of valour There are also castles to be plundered, and at the end of every year you can alter taxes buy troops and deal with all the other bureaucratic tasks that test a hard-pressed duke

The control system is rather novel with a large cursor to steer over the knight in question The problem is that once your troops begin to space out around the playing area it becomes increasingly difficult to keep track of them and to update any commands that were altered when their course met an obstacle

I found the game quickly became repetitive and I suspect that even hardened wargamers will find too few variables here to make those two centuries of command worthwhile

John Minson

Program *Sword and Shield* **Micro** Spectrum 48K **Price** £5 95 **Supplier** Black Kight Computers PO Box 132, Chislehurst, Kent BR7 6LJ

Caverns of rocks

Once upon a time there was a home computer game called *Boulderdash* It involved a little critter called Rockford, represented in appealingly low-tech 2D making his way through caverns of rocks in search of diamonds Such was the success of *Boulderdash* that it sprouted a sequel *Rockford's Riot*, which was vaguely similar but flopped because it was sold in a silly box So it goes

What, I hear you ask, does this have to do with Mastertronic's *Return of Rockman?* Well, the original *Rockman* was fairly similar to *Boulderdash* and the sequel is even more similar You have to guide Rockman through ten caverns full of earth boulders which can sometimes be shoved out of the way diamonds which are your goal and radioactive waste which is best avoided There are a couple of variations on the original scenario, deadly bows become valuable sources of diamonds if waste falls on them (a new principle of physics I believe)

It would all be jolly good fun if it were as fast and smooth as the original CBM 64 or Spectrum versions, but *The Return of Rockman* is slow, lacking in polish and devoid of interesting sound effects

Maybe our C16 was having an off day but really, this is not one of the best Mastertronic efforts

Chris Jenkins

Program *The Return of Rockman* **Micro** C16-Plus **Price** £1 99 **Supplier** Mastertronic, 8-10 Paul Street London EC2A 4HJ



Highest common factors

Tony Kendle wades through Gargoyle's excruciating puns and completes the Marsport solution

Amstrad owners will no doubt be pleased to know that I have heard again from John Lyndon Smith and friends, who form Hacker s Unlimited They have sent some more useful pokes that we will be printing in a week or two

In the meantime, however they have pointed out that the pokes given for the tape version of *Sorcery* apparently do not work on all Amstrad machines (as a result of some unguessable internal changes in the Rom I suppose) and they promise that they are on top of the problem and will be providing the necessary modifications in the near future

Whilst on the subject of pokes can anyone come up with something for infinite lives for Hewson s superb *Uridium* on the Commodore?

Alien items

Now for the rest of our complete *Marsport* solution We left John Marsh having discovered the secret of the antidote and ready to tackle the problems of the vidtex clues

As mentioned last week there are five very hard clues in all that point towards the factoring of certain pairs of items However before you can find and solve all five clues you must deal with the sept warlords (at last!) to make the rest of the complex accessible If you use the valium from the chemists to get past the nerve gas on level B you will find a peculiar item called a topee

When you carry this item around you will soon see that the normally innocent herald robots start to behave like the evil warders – as soon as you see one shoot it or run

This behaviour is the explanation of the clue, Heralds know all that is alien In short the heralds have detected that you are carrying an item that is alien and have decided to attack you It is helpful then to put the topee somewhere safe, both so that it is easier to survive and also so that you will able to tell when you pick up something else that is alien

In fact the next alien item is found by taking the kettle from Farr level in the key slot of the boiler room In here you will find a decidedly dodgy helmet

Factor the helmet and the topee and you will find you have the starlord's power booster Combine this with your gun and you will be endowed with a hypergun that can turn the warlords into a smudge on the wall

The first clue to solve can be found on laxe level One is easy and full of aplomb Not an easy one to solve though The thing that is easy is the cakes (as in a piece of) and the term PLOMB relates to the old fashioned term for lead ie you have to collect all the items for another cake and then all the items for another lead suit and finally combine the two You will end up with something known as the R token

There is a clue on Daly level one draws near and throws away' The thing that throws away is reasonably obviously a projector The thing that draws is a piece of charcoal (don't blame me, I didn't write it)

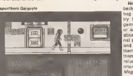
On level C you will find 'one monkey says why the other two can't This obviously relates to the story of the three wise monkeys and you want to find something that stops you from seeing evil (you must construct some more sunglasses) and something that stops you from hearing evil (the earmuffs)

On Elis level there is 'One says nothing, the other says it all The thing that says nothing is the mute from the music room The thing that says it all is a manifesto from the oratory

A mixed beg

The last clue and one that had me stumped for days and groaning when I solved it is on level B One is holy with skill after church' The holy thing is obvious – the strainer from the bar The skill after church is more complicated because it refers to the 'chart' of the sunchart The church is the abbreviation ch and the skill is of coures the art

Marsport from Gargoyle



Once you have factored all the above pairs of items you will find yourself in possession of five tokens E,N,T,E R and Y It doesn t take a genius to realise that this spells something and if you factor all five together you will be supplied with the key that will get you through the sanctum

The final problem you will now face indeed the problem that makes up all of the last section of the game is how to take the plans and get out of Marsport before the time limit runs out and your are blown to pieces

As you travel around the various levels you will have found several peculiar items known as codexes which up till now have had no obvious purpose

The last clue that you will find, and the one that provides the solution to this last problem, is on Joly and reads 7 from 10 makes you a bighead As long as you have mapped the game carefully you will find that there are strangely enough 10 of these codexes and that one occurs on each of the levels A to J If you take the items from each of the levels in turn that spell *BIGHEAD* you will receive the message *HD6 GUNW*

What this means when deciphered is that you should go to the corridor reference HD6 and fire at the west wall with your gun

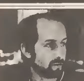
The screen should flash and you will fund that a new up tube has appeared which is near enough to the plans to let you collect them and escape from the spacefield door with relative ease

That is of course the end of our *Marsport* solutions, possibly to the relief of some of you who have been stuck on the last stages of the game

Next week we will be back to a more mixed bag It's always difficult to try to classify Gargoyle games as either arcade or adventure and in the absence of a more rational solution Tony Bridge and I seem to be taking them in turns I have therefore reluctantlysacrificed all interest in *Heavy On The Magick* and would request that all tips for this masterly game should go to him

See you next week


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Real English

This week Tony Bridge offers some help to adventurers having trouble with their real English

It s been a long time since I gave any help to fellow adventurers that s mostly because there are so many new programs to look at and tell you about but also because even four pages a month are not enough to fit everything in and I think that the excellent help services provided by clubs like Roger Garrett's *Guiding Light*, and Henry Mueller's *Adventurer's Club Ltd* are all that the avid adventurer could ask for

Mr T G Toon is getting in a bit of a tizzy about Interceptor "I have just started playing *Forest at World s End* and it is to my mind the most stupid awkward game yet devised by these so-called computer wizards Can you enlighten me as to the real English " that this game is supposed to understand? At the start for example an elf attacks you You cannot *Fight Elf Kill Elf, Use Bow Fire Bow On Arrow* and so on Please tell me what real English' is, in computer terms! *Message from Andromeda* is exactly the same – unless you, can help me I will *never* buy an Interceptor game again "

Now that the Interceptor catalogue is down to a bargain £1 99 I'd hate you to miss out on the other Interceptor adventures Mr Toon They can indeed be frustrating in their use of language, and I agree with you – adventures shouldn't be mere word-matching exercises

As to the Elf just try 48 (or 7) 36,24,50 Very soon, now, you ll have to 18,42 9 46 and later, 58 23 33 So you see that the computer *does* seem to recognise "real English, where many other programs would require you to say something like 54 33 or 18 33 that seems to me to be rather more of an artificial and forced construction than Interceptor s

Other questions that I ve been asked about this adventure in particular, are How do I get past the Dragon (66 45) and How do I get the Key (just 47,8 before entering the Witches Hovel) The key incidentally, is needed to unlock the chest, and the rope to enter the crater (when standing on the overhanging rock 51 63 19 6 and then 58,25 63) The coin and the food are not of any value, though you can of course *Eat* the food

Warlord is another Interceptor adventure which is highly thought of by Bernard Henderson amongst several others (simply magic!) he offers his help to anyone who wants it His address is 25 North Wallington Fareham Hants PO16 8SN

Ivor Williams whose name has been linked with Interceptor adventures many times in The Corner, says that after 13 hours of hard work, he has finally finished the adventure which he reckons is "the most difficult yet from Interceptor, most enjoyable and highly recommended "

Highly recommended

To get started 34 4 27 35 43,12,4,4 46 20 52 39,20 19,39 48 29,7 29 The items not needed are the 10 53 30 and 50 The Amulet is the hardest item to get, but when you first meet the Druid, who has the Amulet, read the Scroll carefully to gain a clue as to what he wants If help is needed on any Interceptor adventure, I'll be glad to help, and my address is Sgt I Williams 29 Engr Regt Wksps REME BFPO 24 "

John Wilson, an old friend of The Corner has sent me a long list of solutions to *Warlord* problems To get the helmet, go to the cavern on the beach and 59,23 5 then 4 52 58 62 13 5 To get the sword wear the helmet cross the causeway then 52,4 52 and 57 To get the shield 38 17,28 17 64

Organised breakdown

From Dennis Goodwin comes several letters regarding adventures that he is currently working on complete with maps and sheets of very organised breakdowns of vocabulary locations and objects along with the solutions to puzzles His favourite appears to be *Mordon s Quest*

And here are some of his hints To get the diamond 14 3 55 To get across the quicksand 41,17 31 To kill the pigmy 41 17 11 To bribe the carniverous plant 41 17 61 53 67 To get past the waterfall 41 17 56 1 17 34 60 17,37 In the barn 41 17 32 49 19 48 26 To activate the Droid 44 28 23 2 The answer to Terzan s question is 15 Although trying to use the cigar is usually met with the Man with No Name theme it *will* be useful in the Arena The password for the Admantium barrier is 22 You can write to him (including SAE of course) at 18 Norman Way Wallingford, Oxon OX10 0SS

1	AND	33	BOAT
2	DROID	34	DAGGER
3	IRON	35	HARE
4	EAST	36	ELF
5	POOL	37	TEMPLE
6	ROCK	38	GIVE
7	KILL	39	RAVEN
8	RING	40	WEAR
9	ACROSS	41	USE
10	SKULL	42	LOG
11	BLOWPIPE	43	WEST
12	UP	44	INSERT
13	OF	45	SHOOT
14	BREAK	46	CHASM
15	FROG	47	WEAR
16	LAY	48	GET
17	THE	49	COUNTER
18	ENTER	50	BOW
19	TO	51	TIE
20	ACORN	52	NORTH
21	AND	53	PIG
22	PERSEVERE	54	GO
23	INTO	55	PYRITE
24	WITH	56	FROG
25	DOWN	57	SLEEP
26	BATTERY	58	CLIMB
27	FREE	59	VASE
28	GUARD	60	AT
29	TORC	61	DEAD
30	SILVER	62	QUIT
31	BLANKET	63	ROPE
32	GEIGER	64	SALT
		65	HORN
		66	BLOW
		67	MY

Adventure Helpline

Going bananas? If you are stuck in an Adventure with nowhere to turn do not despair – help is at hand

Fill in the coupon explaining your problem, send it to us, and a fellow adventurer may be able to help

Remember – the system only works if those adventurers who have solved the puzzles get in touch Every week is Save An Adventurer Today (SAAT) week!

Adventure .... on (Micro) ....

Problem ....

....

Name ....

Address ....

ADVENTURE HELPLINE

Sherlock on C64 How can I find the Old Mill Road near Leatherhead? N Garfod, Fagotvej 68, 2730 Herlev Denmark

Fourth Protocol on Spectrum Of the seven questions which need answers to give you a keyword I'm stuck on the last three 1) What proof do you have? 2) Where did it happen? 3) How was the traitor recruited? Please help me Steven Hill 8 Panlan Road Loughor theenses, West Glamorgan SA4 3QG

Murder on the Moon on Spectrum. I can't find the rifle to shoot the lock on the manor gates open although I do have the bullet Anne Cressland Aurrial House Finstown Orkney KW17 2EB

Spiderman on C16 How do you defeat the ring master? Mr S Fry 48 Leslholm road Santen, Newcastle upon Tyne NE7 7NN

The Neverending Story on C64. How do you save your position? Clive Tomes 19 Pre des Chenes St John, Jersey CI

Mordon's Quest on QL. How do I defeat the gladiator? Where is the pump for the aqualung? Nick Pretzel, 180 Chiswick Village London W4 3DG

Hitchhikers Guide to the Galaxy on Atari ST How do I show the door in the heart of gold that I am intelligent? Mike Morris, 332 Banbury Road, Oxford OX2 7ED

Ship of Quest on Spectrum. How do I press the switch in the control room without being ejected into space? Gareth Edwards 8 Broc Clara Tall Trees Estate, Penkridge Staffs

Spiderman on Spectrum. How do I beat Electro? I can help with Hobbit Hulk Sub Sunk, Espionage island Inca Curse Fourth Protocol (part 1) Mindshadow 1 voyage into the Unknown and Legend Gareth Edwards, 8 Broc Clara, Tall Trees Estate, Penkridge, Staffs.

Spellbreaker on C64 How do I cross to the outcropping? G M Phillips, 8 Peolsford Road London NW9 8HP

Fourth Protocol part 1 on Spectrum. I think I have gone everwhere but I cannot complete the final question James Wheatley 33 Whkeham close Blaby Leicester LE8 3HT

Ground Zero on Spectrum. Where do I build my shelter to survive nuclear attack? Mr N Jones RNEC, Manadon Plymouth PL5 3AQ

Subsunk on Spectrum. How do you unblock the sink? How do you get the pills out of the bottle? What do I do with the yoghurt? How do I use the vacuum? Any help please Caroline James 19 Burnside Avenue Blackpool Lancs.

Robin of Sherlock on Spectrum. I can't get into the castle What do you do on the mystic hill? What do I do anyway? Caroline James 19 Burnside Avenue blackpool Lancs

Gremlins on Spectrum. I do not know where to go after obtaining the camera from Derrys Chris Moore 58 Ledbury Road, Priory Road Hull HU5 5SJ



Half, full and Simplex

David Wallin explains duplex and takes a look at the RS232 interface

This week I ll be looking at the RS232 interface But first a full explanation of duplex is required

For full information on the use of each pin of the RS 232c see *Hotline – a personal guide to computer communcations* by Ben Knox (Century Communications, £6 95 ISBN 0-09-160931-3) This book was an information source for this week's article.

Duplex

Transmission and reception of data may be in one of three duplexes' or modes, they are Full Duplex, Half Duplex and Simplex

Simplex – This mode of operation allows data to either be sent or received, but not both. Simplex Data Transmission means that data may be transmitted but not received Similarly, Simplex Data Reception means that data may be received but not transmitted A normal radio receiver is a received, but not transmitted A normal radio receiver is a simlex device, you pick up sound transmitted from a studio, but you can't talk back

Half Duplex – Half duplex allows data to be sent or received but not at the same time When transmitting data, you cannot receive anything and when receiving you can t transmit Walkie-Talkies and CBs are half duplex devices On a computer-modem link the TxD and RxD pin are required Also the protective ground should be wired up

Full Duplex – Full duplex allows you to receive and transmit at the same time A telephone is a full duplex device, you can hear and talk at the same time Most home micros will work with full duplex modems, but are not capable of doing two things at once, (ie, transmitting and receiving) and so they operate in half duplex Micros like the Amiga which can multi-task would be able to receive and transmit at one time Full duplex is expensive and usually requires four lines TxD RxD, protective ground and signal ground (pin 9)

The most common duplex is half and, unless stated otherwise, the information in this article applies to half duplex operation

How RS 232 began

Over 20 years ago, the Electronics Industries Association of Washington DC decided that they needed a standard for connecting any computer (be it micro, mini or mainframe) to any serial device (ie modem, printer or robot) A standard was set and this was known as Agreement RS232 The most common RS standard used today the V24 version, is agreement RS 232c which was introduced in 1969

Many home micros (including the BBC) have an RS 423 interface port This is a budget version of the full 232c As most data links (connaction of micro and device) require usse of only five of the 25 pints, the RS 423 was designed as a five pin serial port. Also many micros that claim to have an RS 232 or an RS 232c, in fact have a cut down version, very few use all of the 25 pins

The RS 423

As mentioned abdve RS 423 has only five pins This is because most of the other pins are not required and those that are can be 'created' by combining the available pins The five pins used are

Name	Abbreviation	Pin number
Protective ground	(Gnd)	1
Transmit data	(TxD)	2
Received data	(RxD)	3
Request to send	(RTS)	4
Clear to send	(CTS)	5

Some modems have the inputs and outputs (TxD and RxD) labelled differently, so check the manual for proper wiring up details In fact only three pins are essential as the CTS and RTS lines are hardly ever used these days This is because their job can be done by a buffer an area of Ram (about 128 bytes, (⅛K) in which data waits as if in a kind of queue

CTS and RTS

The purpose of CTS and RTS are to prevent *data collisions* This is when data is going in both directions on a half duplex line and there is literally a crash as the two collide This results in loss of and damage to data To prevent this CTS and RTS are available

If the computer wishes to send data, it *raises* or *take high* the RTS line (it requests permission from the modem to send some data) In plain English it applies to voltage to it When the modem is ready and able to send data it raises the CTS line (telling the computer it is clear to send) The data is then sent. After it has all been sent RTS and CTS are lowered the voltage is dropped

Full duplex has no need for the CTS and RTS as Txed (transmitted) data and Rxed (received) data travel along different wires

RS 232c link

It is useful to know what all the pins on an RS 232c are for so here s a list

Pin No.	Description	Abbreviation
1	Protective ground	Gnd
2	Transmitted data	TxD
3	Received data	RxD
4	Request to send	RTS
5	Clear to send	CTS
6	Data set ready	DSR
7	Signal ground	Gnd
8	Received line signal detector	
9	Reserved	
10	Reserved	
11	Unassigned	
12	Secondary received line signal detector	
13	Secondary clear to send	2nd TxD
14	Secondary transmitted data	2nd TxD
15	Transmitter signal element timing	DCE source
16	Secondary received data	2ndRxD
17	Receiver signal element timing	DCE source
18	Unassigned	
19	Secondary request to send	2ndRTS
20	Data terminal ready	DTR
21	Signal quality detector	
22	Ring indicator	RI
23	Data signal rate selector	
24	Transmit signal element timing	DTE source
25	Unassigned	

Unassigned means that the pin has no use the two unassigned pins take the number of pins up to 25, a standard connector size Reserved means that the pin is there for the manufacturers to do what they like with They are not subject to either RS 232 or CCITTT regulations and may be used for testing, etc They usually perform functions which only that device has

The connectors

The two common connectors are

1) The standard 25 way RS 232 D' socket An elongated D shape The female is usually found on the computer and the male on the modem/device The pin numbers correspond to the RS 232 pin number

2) The five pin RS 423, as found on the BBC and many other cheaper home micros The computer usually has the female connector.

If you have any queries, tips or comments to make about any aspect of micro communications, David Wallin would love to hear from you

Write to him at *Popular Computing Weekly* 12-13 Little Newport Street London WC2H 7PP



FUNCTIONS

by Mike O'Donnell

One of the beauties of QL SuperBasic is the way that procedures and functions are used to expand the Basic They are then used as the usual Basic commands are rather than being called as in other Basics For example, on most machines a function to return the cube root of a number would be executed by something like, *Print FNcu (n)* More often than not you are limited to a two character name On the QL the *FN* or *Proc* part is omitted resulting in, *Print Cube-Root (n)* The function name can be any length

This brings us to the listing A useful feature that the Amstrad has is the ability to change a string to upper or lower case with the *Uppers* and *Lowers* functions My first two functions do the same (Once the listing has been entered you can use any of them – there is no need to type Run)

To change a string s case try something like *Print Uppers (HellO ThERe)* It will return *Hello There* Or you could try *a$ = 'FrEDd a$ = Lowers (a$) Print a$* This will return *'fred* Only the relevant characters are altered, so numeric characters, punctuation etc are left alone

The three remaining functions are fairly obvious they give the string handling commands found on most other machines Once you are used to it, Sinclair string splitting is (I think) more advanced than that found on other machines but beginners may find my functions useful whilst getting used to other aspects of the QL. They may also be handy for those interested in converting programs to the QL from other machines, without spending too much time altering things

They are used as the same functions would be in other Basics eg *Print Lefts (a$ 4)* will return the four leftmost characters of a$ while *Print Mids (a$ 3 5)* will give five characters from *a$*, starting at character number 3 *Print Rights (a$ 3)* will give the last three characters of *a$*

I have added some simple error trapping if you ask for more characters than there are in a string, you will get only what is there, and an empty string will return nothing

A peculiarity of SuperBasic is that function, procedure and variable names are stored as soon as they are entered If you like your commands to be in upper case, typing them so just once ensures that they appear that way each time you enter them into a program line

The reason for the line numbers starting at 30000 is that I find it useful to save procedures and functions to microdrive, numbered from 30000 upwards They can then be merged into a program and the whole thing renumbered to allow further merges

```
30000 REMark   SuperBasic Functions
30010 REMark  by Mike O'Donnell
30020 :
30030 :
30040 DEFine FuNction LOWER$(a$)
30050 IF a$="" THEN RETurn a$
30060 FOR n=1 TO LEN(a$)
30070   IF CODE(a$(n))>64 ANO CODE
      (a$(n))<91 THEN
30080     a$(n)=CHR$(CODE(a$
      (n)) ;| 32)
30090     END IF
30100   ENO FOR n
30110 RETurn a$
30120 END DEFine LOWER$
30130 :
30140 :
30150 DEFine FuNction UPPER$(a$)
30160 IF a$="" THEN RETurn a$
30170 FOR n=1 TO LEN(a$)
30180   IF CODE(a$(n))>96 AND CODE
      (a$(n))<123 THEN
30190     a$(n)=CHR$(CODE(a$(n))
      && 223)
30200     END IF
30210   END FOR n
30220 RETurn a$
30230 END DEFine UPPER$
30240 :
30250 :
30260 DEFine FuNction LEFT$(a$,n)
30270 IF a$="" THEN RETurn a$
30280 IF n>LEN(a$) THEN n=LEN(a$)
30290 IF n<1 THEN RETurn ""
30300 RETurn a$(1 TO n)
30310 END DEFine LEFT$
30320 :
30330 :
30340 DEFine FuNction RIGHT$(a$,n)
30350 IF a$="" THEN RETurn a$
30360 IF n<1 THEN n=1
30370 IF n>LEN(a$) THEN RETurn a$
30380 RETurn a$((LEN(a$)-n)+1
      TO LEN(a$))
30390 END DEFine RIGHT$
30400 :
30410 :
30420 DEFine FuNction MID$(a$,n,m)
30430 IF a$="" THEN RETurn a$
30440 IF n<1 THEN n=1
30450 IF n+m>LEN(a$) THEN RETurn a$
      (n TO LEN(a$))
30460 RETurn a$(n TO n+m-1)
30470 END DEFine MID$
```

SPRITE PRINTER

by Frank Bingley

A useful utility for any CBM64 programmer is a sprite editor These excellent programs make easy work of creating sprites, so much so that it doesn't take long to accumulate quite a collection

What with sprites for one program or another some stored as Basic loaders some as Boot Files, it can become quite a tricky business remembering what you have where it is stored, or what part of memory holds the sprite data!

Having been in this position myself, it didn't take long for me to realise that it would be handy to have some sort of catalogue with a computer print-out of each sprite and where it is sorted, etc This prompted me to write the following utility called Sprite Printer

Written in Basic, this short program is not a sprite editor but is designed to be used in conjunction with one especially if you have a machine code editor which resides from $C000 upwards It is then possible to have both programs in memory at once, switching between each utility as necessary For those of you with basic sprite editors, it would be best to design your sprites first then load 'Sprite Printer' whilst the sprite data is still in place, to get printed records

When run the program will present a table of options along with a sprite on the right-hand side of the screen

Option (m) will display the sprite in multicolour mode

Option (o) will display the sprite in hi-res mode

Option (+) and **Option (-)** is a fast search facility which can be used to find known or unknown sprites These two options simply increment or decrement the sprite pointer to the desired location It will wrap-around at each end of the table

Option (e) will end the program

Option (p) will give a printed representation of the current sprite shown on the screen This will produce one of four different results, according to what other flags are set in the program

If the sprite on screen is in hi-res mode then a hi-res replica will be produced The numbers at the top of the grid represent the bit numbers On the other hand if the sprite on screen is in multi-colour mode, then a multi-colour picture will be printed (The colours represented by shades of grey)

To get a true bit pattern for multi-colour sprites it will be necessary to press option (o) before printing the sprite Finally with the sprite pointer pointing to block number #0, a blank grid will be drawn This is useful for designing sprites without the computer or editor or where a sequence of sprites are needed for animation purposes where only slight pixel differences are required (The sprite pointer is set at this position by default)

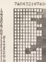
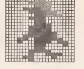
It should be pointed out at this stage that if some sprite data is stored very low

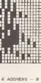
```
1 DIM SP(64) POKE53285,6 POKE53286,3:POKE53287,
     1 FORA=1TO13:SP$=SP$+CHR$(32)
2 NEXTA POKE53248,255 POKE53249,160 POKE53269,1
     :POKE53280,10:POKE53281,0 DD=0
3 FORA=1TO8 READD S(A)=D NEXT OPEN4,4:OPEN6,4,6
     :PRINT#6,CHR$(23):POKE650,255
4 FORA=1TO8 READD S2(A)=D NEXTA V=0 POKE53276,0
5 PRINTCHR$(147)CHR$(158)CHR$(18)SP$,"SPRITE PRINTER";SP$
6 PRINT"OPTIONS -" PRINT PRINT" (M) MULTICOLOUR ON"
7 PRINT PRINT" (O) MULTICOLOUR OFF"
8 PRINT:PRINT" (P) PRINT SPRITE" PRINT:PRINT" (+) INCREMENT SPRITE"
9 PRINT:PRINT" (-) DECREMENT SPRITE" PRINT.PRINT"
     (E) END":PRINT PRINT
10 GETO$ IFO$="P"THEN25
11 IFO$="M"THENPOKE53276,1 V=1
12 IFO$="O"THENPOKE53276,0:V=0
13 IFO$="+"THENDD=DD+1 IFDD=256THENDD=0
14 IFO$="-"THENDD=DD-1:IFDD=-1THENDD=255
15 IFO$="E"THEN200
16 POKE2040,DD:PRINTCHR$(145);"CURRENT SPRITE BLOCK
     NO ",DD,CHR$(157)"  "
17 GOTO10
25 AD=DD*64 P$=""
26 IFDD=0THENFORA=1TO64 SP(A)=0 NEXT GOTO36
30 FORA=1TO64:SP(A)=PEEK(AD-1+A):NEXT
36 PRINT:PRINT"ADDRESS -"AD
37 PRINT#4,"SPRITE NUMBER -"DD"ADDRESS -"AD PRINT#4,
38 PRINT#4,SPC(5)"765432107654321076543210"CHR$(13)
39 IFV=1THEN300
40 A=1:FORB=1TO21:PRINT#4,B;SPC(4-(LEN(STR$(B))));CHR$(167),
     FORC=1TO3 FORF=1TO8
50 IFSP(A)=>S(F)THENGOSUB100 SP(A)=SP(A)-S(F):GOTO65
60 P$=P$+CHR$(112)
65 NEXTF:A=A+1:PRINT#4,P$; P$="" NEXTC PRINT#4, NEXTB
75 PRINT#4,SPC(5), FORA=1TO24:PRINT#4,CHR$(163);:NEXTA PRINT#4,
90 GOTO5
100 P$=P$+CHR$(18)+CHR$(32)+CHR$(146) RETURN
200 PRINT#4,:CLOSE4,0 POKE53269,0 END
300 A=1 FORB=1TO21:PRINT#4,B;SPC(4-(LEN(STR$(B))));CHR$(167),
310 FORC=1TO3 FORF=1TO4:X=SP(A)ANDS2(F)
320 IFX=S2(F)THENP$=P$+CHR$(18)+CHR$(32)+CHR$(32)+CHR$(146) GOTO360
330 IFX=0THENP$=P$+CHR$(112)+CHR$(112) GOTO360
340 IFX=S2(F+4)THENP$=P$+CHR$(166)+CHR$(166) GOTO360
350 P$=P$+CHR$(17)+CHR$(165)+CHR$(163)+CHR$(145)
360 NEXTF:A=A+1:PRINT#4,P$, P$="" NEXTC PRINT#4, NEXTB
370 GOTO75
500 DATA 128,64,32,16,8,4,2,1
510 DATA 192,48,12,3,64,16,4,1
```

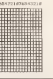
down in memory, then it may clash with where this program is stored. Equally so, due to the way the computer handles strings, prolonged use of Sprite Printer may overwrite some sprite data, but this is seldom the case.

Program Notes

1-2	Set up array to hold sprite data. Initialise sprite colours and positions screens colours
3-4	Fill arrays with bit data, open channels to printer
6-9	Screen display
10-17	Analyse input
25	Fill sprite data array with zeros if sprite pointer at zero
30	Fill sprite data array
36-90	Work out bit values and print hi res sprite
100	Subroutine to print reverse space
200	Close printer channels, turn off sprite and end program
300-370	Work out multicolour bit values and print multicolour sprite
500-510	Data for bit values
520-560	Credits



Programming: Amstrad





DATA BASE

by B Baxter

This utility program (printed over two weeks) was generated simply out of need and the fact that at the time I could find nothing similar at a realistic price.

My requirements were for a simple data base of names and addresses which I could access either as a group or individually and then print-out either to labels or a list. The Search and Delete routines were added as a means of quickly locating a particular file which needed to be amended or deleted without fuss whilst the Alphabetical Sort was added to tidy up the list. I now keep all my names and addresses on this data base and intend to elaborate still further with telephone numbers, etc.

At least it is a package which didn't cost me an arm and a leg and which I find was well worth the trouble to generate.

The print-out to labels was designed for the single label roll as I found these convenient, but little modification is required for the multiple labels rolls. Printer output was to an Epson printer MX 82F/T although for the purpose of this article I did not include an instruction to cancel the Step over Perforation which can be obtained by the integral switches on this machine. My own copy has this built in the label option routine and will be obvious by the make of printer used.

For individual addressing of envelopes by the printer, a simple TAB instruction is used to position the print head as required

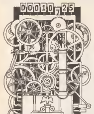
I included a variable *X* for my own use which could be set to tabulate for any envelope size

Note that the variable *M* has been set for 100 entries but this may be altered to suit

Also the cassette has been used as a storage medium but disc storage may be used as required with slight modification to the output stream

Next week the rest of the listing, plus a few brief program notes. In the meantime for the impatient, tape copies of the program are available at a cost of £2.50. Write to PO Box 17, Burnham on Sea, Somerset TA8 1DT

```
30 REM ********************
40 REM * ADDRESS MASTER *
50 REM *                *
60 REM *    B SOXTER    *
70 REM ********************
80 REM
90 B=FRE(""): REM GARBAGE COLLECTION
100 M=100: REM ALTER TO SUIT
110 E$=CHR$(93): REM E$=] END OF LIST MA
RKER
120 REM N$=NAMES:A1$=ADDRESS1:A2$=ADDRES
S2:A3$=ADDRESS3:A4$=ADDRESS4
130 REM C=LIST COUNTER:A$=ANSWERS
140 DIM N$(M),A1$(M),A2$(M),A3$(M),A4$(M
): REM SET UP ARRAYS
150 N$(C)=E$: REM SET END OF LIST MARKER
160 WHILE OPT<11: REM SET LOOP
170 MODE 1:PRINT"* MENU *":PRINT:PRINT
180 PRINT" 0  Rules of Engagement ":PRIN
T
190 PRINT" 1  Create New List ":PRINT
200 PRINT" 2  Alpha Sort ":PRINT
210 PRINT" 3  Add New Name & Address ":P
RINT
220 PRINT" 4  Delete Name & Address ":PR
INT
230 PRINT" 5  Search for Name & Address
":PRINT
240 PRINT" 6  Output to Printer ":PRINT
250 PRINT" 7  Save the List ":PRINT
260 PRINT" 8  Load the List ":PRINT
270 PRINT" 9  End of Program ":PRINT
280 PRINT:PRINT"Select Option ..."
290 A$=INKEY$:IF A$="" THEN 290
300 IF ASC(A$)<48 OR ASC(A$)>57 THEN 190
310 OPT=ASC(A$)-47
320 ON OPT GOSUB 360,880,1220,1460,1[illegible],
1[illegible],[illegible],2310,2490,2700
330 WEND
340 REM
350 REM ***************************
360 REM * 0  Rules of Engagement *
370 REM ***************************
380 REM
390 CLS:PRINT"* RULES OF ENGAGEMENT *":P
RINT:PRINT
400 PRINT"* 1. Create New List...":PRINT
410 PRINT"* 3  Add N & A  to List...":PR
INT:PRINT
420 PRINT"Address Master is designed to
store and retrieve " M " ... addresses
":PRINT
430 PRINT"All entries are restricted to
a maximum of five lines of data. This in
cludes any County, Country or Postal Code
 & Tel No. ... Enter CR for Blank li
nes ":PRINT
440 PRINT"The layout of the entry is res
tricted by the size of Label used for Pos
ting. The actual address may be altered
to suit a label size ":PRINT
450 PRINT"An entry is numbered and a Cou
nt kept indicates the size of th
e list ":PRINT
460 LOCATE 3,20:PRINT"Press Space Bar to
 Turn Page "
470 A$=INKEY$:IF A$="" THEN 470
480 IF A$<>" " THEN 470
490 CLS:PRINT"Example ":PRINT:PRINT
500 PRINT"Name       B. Soxter"
510 PRINT"Address    P.O  Box 17"
520 PRINT"Address    Burnham on Sea"
530 PRINT"Address    Somerset"
540 PRINT"Address    TA8 1DT"
550 PRINT:PRINT"A List is terminated wit
h a close ":PRINT
560 PRINT"      ] ":PRINT
570 PRINT"The terminator ] is entered
into the  Name position following the l
ast entry ":PRINT
580 PRINT"The terminator is used as an e
nd of listmarker and will return control
 to the  Menu ":PRINT
590 PRINT"Same rules apply to the 3rd o
ption of  Add New Name & Address   "
600 LOCATE 3,20:PRINT"Press Space Bar to
 Turn Page "
610 A$=INKEY$:IF A$="" THEN 610
620 IF A$<>" " THEN 610
630 CLS:PRINT:PRINT
640 PRINT"* 2  Alphabetical Sort... ":PRIN
T
650 PRINT"As its name implies, Alpha So
rt sorts the list of N.& A. into an alp
habetical order. This commences with th
e first  character of the Name and is
consequential throughout the entry i.e B. So
xter wouldprecede C. Soxter etc...":PRINT
660 PRINT"It is advisable to invoke an A
lpha Sort  at the completion of any list
...":PRINT
670 PRINT:PRINT"* 4  Delete Name & Addre
ss...":PRINT
680 PRINT"To Delete any N.& A. the entry
 must be  the same as that already store
d in the list  CAUTION  when in use
":PRINT"Spaces & Dots are Legal ..."
690 LOCATE 3,20:PRINT"Press Space Bar to
 Turn Page "
700 A$=INKEY$:IF A$="" THEN 700
710 IF A$<>" " THEN 700
720 CLS
730 PRINT:PRINT"* 5  Search for Name & A
ddress  ":PRINT
740 PRINT"This routine will Search for a
 N & A  as requested. Again  the request
ed name  should be exactly as stored in
 the list.":PRINT
750 PRINT"The result is displayed and an
 option to output to a line printer is gi
ven.  The search will continue for anoth
er name in the list, and if not found, wi
ll return control to the Menu ":PRINT
760 PRINT:PRINT"* 6 Output to Printer..":P
RINT
770 PRINT"Two options are given  Output
 List will printout contents in Horizonta
l format  Output to labels will printou
t contents in Vertical format. Some adju
stment may be needed to facilitate the us
ers needs ":PRINT
780 LOCATE 3,20:PRINT"Press Space Bar to
 Turn Page "
790 A$=INKEY$:IF A$="" THEN 790
800 IF A$<>" " THEN 790
810 RETURN
820 REM
830 REM ***************************
840 REM * 1  Create New List *
850 REM ***************************
860 REM
870 C=1: REM START COUNT
880 CLS:PRINT"* CREATE NEW LIST *":PRINT
890 PRINT"ENTRY ";C;" of ";M
900 PRINT:PRINT"Name       ";:GOSUB 1100
910 N$(C)=P$:PRINT
920 IF N$(C)=E$ THEN RETURN
930 PRINT:PRINT"Address    ";:GOSUB 1100
940 A1$(C)=P$:PRINT
950 PRINT:PRINT"Address    ";:GOSUB 1100
960 A2$(C)=P$:PRINT
970 PRINT:PRINT"Address    ";:GOSUB 1100
980 A3$(C)=P$:PRINT
990 PRINT:PRINT"Address    ";:GOSUB 1100
1000 A4$(C)=P$:PRINT
1010 PRINT:PRINT:PRINT:PRINT"Correct,
?  (Y/N)"
1020 A$=INKEY$:IF A$="" THEN 1020
1030 IF A$="N" THEN 880
1040 IF A$<>"Y" THEN 1020
1050 C=C+1: REM INCREMENT COUNT
1060 IF C=M THEN LOCATE 3,20:PRINT"List
Complete..":FOR T=0 TO 1000:NEXT T:GOTO
160
1070 CLS:GOTO 880: REM RETURN FOR ANOTHE
R
1080 REM
1090 REM ***************************
1100 REM * Keyboard Input Routine *
1110 REM ***************************
1120 REM
1130 P$=""
1140 K$=INKEY$:IF K$="" THEN 1140
1150 IF ASC(K$)=13 THEN RETURN
1160 IF ASC(K$)=127 AND LEN(P$)=0 THEN 1
140
1170 IF ASC(K$)=127 THEN P$=LEFT$(P$,LEN
(P$)-1):PRINT CHR$(8) CHR$(16);:GOTO 114
0
1180 PRINT K$;
1190 P$=P$+K$:GOTO 1140
1200 REM
1210 REM ***************************
1220 REM * 2  Alphabetical Sort *
1230 REM ***************************
1240 REM
1250 CLS:PRINT"* ALPHABETICAL SORT *":PR
INT
1260 IF C=0 THEN PRINT"List Empty   ":FO
R T=0 TO 1200:NEXT T:RETURN
1270 PRINT:PRINT"Alphabetical Sort in pr
ogress. - Please wait  "
1280 C=1: REM SET COUNTER
1290 IF N$(C)=E$ THEN N=C-1:GOTO 1310
1300 C=C+1:GOTO 1290: REM INCREMENT COUN
TER AND RETURN
1310 FOR Q=1 TO N-1
1320 FOR R=Q+1 TO N
1330 IF N$(R)>=N$(Q) THEN 1390
1340 S$=N$(R):N$(R)=N$(Q):N$(Q)=S$
1350 S$=A1$(R):A1$(R)=A1$(Q):A1$(Q)=S$
1360 S$=A2$(R):A2$(R)=A2$(Q):A2$(Q)=S$
1370 S$=A3$(R):A3$(R)=A3$(Q):A3$(Q)=S$
1380 S$=A4$(R):A4$(R)=A4$(Q):A4$(Q)=S$
1390 NEXT R
1400 NEXT Q
1410 RETURN
1420 REM
1430 REM ***************************
1440 REM * 3  Add New Name & Address *
1450 REM ***************************
1460 REM
1470 CLS:PRINT"* ADD NEW NAME & ADDRESS
*":PRINT
1480 IF C=0 THEN PRINT"List Empty.  ":FO
R T=0 TO 1000:NEXT T:RETURN
1490 C=1: REM SET COUNTER
1500 IF N$(C)=E$ THEN 1520
1510 C=C+1:GOTO 1500
1520 IF C=M THEN PRINT"*  LIST COMPLETE
 *":FOR T=1 TO 1250:NEXT T:RETURN
1530 N$(C+1)=E$
1540 GOSUB 900
1550 RETURN
1560 REM
```



SCREEN COPIES

by Stuart Nicholls

Most Centronics printer interfaces include a routine that allows high resolution screen copies to be produced However in many cases these copies are too small to see all the detail This is the case with my Shinwa printer and Kempston interface To correct this I have written my own routines to produce 2× size as well as 1× size copies of all 24 screen lines

This is not as straightforward as it first appears An Epson RX80 printer, for example only allows 480 bit images per line in single bit image mode This is the mode that gives the correct height/width combinations for a screen copy and, as there are 256 pixels across the Spectrum display file when producing 2× size copies one needs 512 bit images per line Another problem occurs when trying to 'point' the Edit lines to find the state of eight vertical pixels

These two problems fortunately have the same answer, namely to rotate the copy 90 degrees clockwise to put the short side of the copy across the paper instead of down the paper

We now require only 192 × 2 = 384 bit images per line and, what is more useful, it allows us to use display file addresses directly to find the state of eight vertical pixels

If we look at a routine for single size copies you will see that we can start at the bottom of the left hand column *Peek* the byte value and transmit it directly to the printer as eight pixels thus requiring no juggling of values associated with horizontal copying We can move up the column one byte at a time until we reach the top then advance the paper by 8/72 spacing and continue on to the next column This process is fast enough to write a program in Basic to demonstrate the principle (see List 1) This program is slow but still usable

You will notice that this Basic program has its own printer interface routine *(Gosub 20)* and does not use *Lprint* This is because values above 127 when *Lprinted* are modified by my Kempston software into keywords thus corrupting the data

The 2× size copy routine is based on the same principle but this time each column is scanned twice The first time to print bits 7 to 4 (as 77665544), the second time to print the bits 3 to 0 (as 33221100)

To enter the machine code for these routines use List 2 which will also save the code as *'Copy' Code 64000 299* Remember before reloading the code, enter *CLEAR 63999*

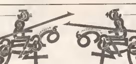
To produce 1× size copies use *Randomize Usr 64222* and for 2× size copies use *Randomize Usr 64000* A *Break* routine is included in the code but is only active at the end of a screen line This has been done to avoid problems with partial bit image data being sent to the printer If *Break* is used in the Basic program then the printer will probably require switching off to re-initialise

Finally these routines may need slight modification for other printer/interface combinations

```
  10 REM * MACHINE CODE LOADER PROGRAM *
  20 CLEAR 63999
  30 LET LINE=1000
  40 FOR A=64000 TO 64303 STEP 8
  50 RESTORE LINE: LET Z=0
  60 FOR B=A TO A+7
  70 READ C: IF C>255 THEN  GO TO 500
  80 POKE B,C: LET Z=Z+C
  90 NEXT B
 100 READ TOTAL: IF TOTAL<>Z THEN  GO TO 500
 110 LET LINE=LINE+10
 120 NEXT A
 130 PRINT "O.K.  NOW SAVE M/CODE"
 140 SAVE "COPY"CODE 64000,299
 150 STOP
 500 BEEP 1,1: PRINT "INCORRECT DATA IN LINE ";LINE
 510 PRINT "PLEASE EDIT LINE THEN RE RUN"
 520 PAUSE 100: LIST LINE
 530 STOP
1000 DATA 205,134,250,205,155,250,33,224,1456
1010 DATA 87,229,205,171,250,14,8,229,1193
1020 DATA 126,87,95,6,4,203,18,23,562
1030 DATA 203,19,23,16,248,205,192,250,1156
1040 DATA 205,192,250,124,37,230,7,32,1077
1050 DATA 231,225,125,214,32,111,13,32,983
1060 DATA 222,124,214,8,103,254,63,32,1020
1070 DATA 212,62,10,205,192,250,225,205,1361
1080 DATA 84,31,210,0,13,229,205,171,943
1090 DATA 250,14,8,229,126,87,95,6,815
1100 DATA 4,203,26,31,203,27,31,16,541
1110 DATA 240,205,192,250,205,192,250,124,1646
1120 DATA 37,230,7,32,231,225,125,214,1101
1130 DATA 32,111,13,32,222,124,214,8,756
1140 DATA 103,254,63,32,212,62,10,205,941
1150 DATA 192,250,225,205,84,31,210,0,1197
1160 DATA 13,44,194,9,250,201,1,191,903
1170 DATA 227,33,154,250,203,70,192,62,1191
1180 DATA 129,237,121,62,15,237,121,203,1125
1190 DATA 198,201,0,62,27,205,192,250,1135
1200 DATA 62,65,205,192,250,62,8,205,1049
1210 DATA 192,250,201,62,27,205,192,250,1379
1220 DATA 62,75,205,192,250,62,128,205,1179
1230 DATA 192,250,62,1,205,192,250,201,1353
1240 DATA 229,197,1,191,227,30,14,197,1086
1250 DATA 5,237,88,203,58,56,250,243,1132
1260 DATA 5,5,237,121,193,237,89,28,915
1270 DATA 237,89,251,193,225,201,205,134,1535
1280 DATA 250,205,155,250,33,224,87,229,1433
1290 DATA 205,23,251,6,8,229,126,205,1053
1300 DATA 192,250,124,37,230,7,32,246,1118
1310 DATA 225,125,214,32,111,16,238,124,1085
1320 DATA 214,8,103,254,63,32,228,62,964
1330 DATA 10,205,192,250,205,84,31,210,1187
1340 DATA 0,13,225,44,32,209,201,62,786
1350 DATA 27,205,192,250,62,75,205,192,1208
1360 DATA 250,62,192,205,192,250,175,205,1531
1370 DATA 192,250,201,0,0,0,0,0,643
```

```
10 GOTO 80
20 REM * PRINTER INTERFACE SUBROUTINE *
30 LET X=IN 58367: IF INT(X/2)<>X/2 THEN GOTO 30
40 OUT 57343,Z: OUT 58303,14: OUT 58303,15: RETURN
50 REM * START PROGRAM BY LOADING SCREEN TO BE COPIED *
60 PRINT AT 11,2;"LOAD_SCREEN_TO_BE_COPIED_NOW"
70 LOAD ""SCREEN$
80 REM * INITIALISE KEMPSTON INTERFACE *
90 OUT 58303,128: OUT 58303,15
100 RESTORE 290
110 REM * SET PRINTER TO 8/72 SPACING *
120 FOR A=1 TO 3: READ Z: GOSUB 30: NEXT A
130 FOR A=22496 TO 22527
140 LET B=A: RESTORE 300: REM * SET BIT IMAGE MODE *
150 FOR Q=1 TO 4: READ Z: GOSUB 30: NEXT Q
160   FOR F=1 TO 3         : REM * THREE SCREEN SECTIONS *
170     FOR D=1 TO 8       : REM * 8 CHARS PER SCREEN THIRD *
180       LET E=B
190       FOR C=1 TO 8     : REM * 8 BYTES PER CHAR. *
200         LET Z=PEEK B: GOSUB 30: LET B=B-256
210       NEXT C
220       LET B=E-32
230     NEXT D
240     LET B=B-1792
250   NEXT F
260   LET Z=10: GOSUB 30   : REM * PRINT A LINE FEED *
270 NEXT A
280 PAUSE 0                : REM * HOLD SCREEN PICTURE *
290 DATA 27,65,8           : REM * CODES FOR 8/72 LINE SPACING *
300 DATA 27,75,192,0       : REM * CODES FOR 192 BIT IMAGES/LINE *
```

Programming: BBC



MARBLE MANIA

by Shawn McAvery

This is a game for both the BBC B and Electron, called *Marble Mania*. It involves you guiding a marble across a three dimensional landscape, to the goal at the bottom of the screen.

The display will then scroll up to reveal the second half of the level – in all there are 12 screens, making a total of six levels to complete.

First, type in the loader program (printed in full this week) and save it to tape. Now start typing in the main program, which we'll be finishing off next week. This should be saved directly after the loader on the tape. Chaining the loader should load and run the main program automatically. For use on the Electron, line 1220 should be altered to read

DEFPROCslow:ENDPROC

Anyone who doesn't want to type the program in can obtain tape copies from the author, at a cost of £3.00. Write to Shawn McAvery at 83 Tipner Road, Stamshaw, Portsmouth, Hants PO2 8QP.

```
[illegible]
```

```
[illegible]
```

```
[illegible]
```

UDG Editor on Spectrum

by Geoffrey Wearmouth

UDG Editors – you've got plenty – but this one is so tiny it will fit in the printer buffer That means you don't have to alter Ramtop before loading and you won't corrupt the program you wish to modify

Such a program should not define characters in Data statements, but start by loading the character codes Similarly it should have a routine that saves the character codes after the basic program

To add this utility to your toolkit, just type in the listing and run If you get the OK message save the contents of the printer buffer with *Save "udg" Code 23296 256*

To use the editor enter – *Randomise Usr 23296* The control keys are shown in the listing

If you have a rubber keyboard then the following pokes remove the need to press Shift with the cursor keys and use 0 for plotting *Poke 23543,53 Poke 23545 56 Poke 23547.54 Poke 23549 5 Poke 23541 58*

```
 1 REM G.Wearmouth. 1985.

   udg Editor.

 2 REM any Spectrum

  3 DATA 0,205,175,13,253,119,4
8,62,128,33,244,71,30,32,6,65
  4 DATA 25,119,16,252,45,53,15
,48,251,30,64,33,37,64,205,148
  5 DATA 91,175,0,50,53,91,205,
220,91,30,143,33,101,64,205,188
  6 DATA 91,33,101,88,17,0,0,25
,54,120,33,143,87,30,20,1
  7 DATA 1,1,253,112,87,123,214
,80,95,22,80,203,6,159,246,128
  8 DATA 21,18,203,1,48,250,159
,18,28,203,0,48,236,37,203,100
  9 DATA 32,227,1,120,15,197,4,
62,141,145,79,205,217,13,253,94
  10 DATA 253,33,200,0,205,181,3
,62,93,215,30,0,92,253,78,206
  11 DATA 33,253,91,205,220,22,4
8,245,110,193,58,33,91,205,21,23
  12 DATA 40,168,24,143,76,205,2
32,10,8,21,28,123,215,16,251,201
  13 DATA 225,42,123,92,245,7,7,
7,95,20,17,143,80,6,8,26
  14 DATA 119,20,35,16,250,241,5
0,254,21,201,205,161,91,61,200,6
  15 DATA 29,201,5,5,4,203,88,24
,5,13,13,12,203,89,200,237
  16 DATA 67,97,91,175,201,193,2
29,34,22,3,159,20,190,144,253,11
4
  17 DATA 87,33,143,80,205,236,1
0,215,201,113,160,105,218,110,16
1,99
  18 DATA 216,103,220,98,188,32,
213,8,201,9,203,10,194,11,196,0
 100 PRINT " Just Checking"
 200 LET s=0: LET a=23296
 210 READ b: POKE a,b: LET s=s+b
: LET a=a+1: IF a<23552 THEN GO
TO 210
 220 IF s<>26628 THEN  PRINT "Ch
ecksum Error": STOP
 230 CLS

1000 REM Control keys
  Cursor keys - grid cursor
  Space Bar   - plot/unplot
  "n" - next character
  "b" - back one character
  "q" - quit
  "c" - clear grid
  "i" - inverse design

 n,b & q save current design.
```

Dotted Lines on QL

by D G Neville

A very basic requirement of any graphics design toolkit is the ability to draw dotted lines between two points The procedure given opposite will do this for the Sinclair QL.

Firstly we can identify the inputs to the procedure

x1 y1 and *x2, y2* are the start and end of the required line

l is the length of the dots and *w* the width

To determine the number of dots *(nl)* and the start of each separate line to be drawn *(x3, y3)* we first determine the length of the line using Pythagoras *(d)* and the step size in both the *x* and *y (x0* and *y0)*

The procedure can be fairly easily amended to print dots and spaces between dots of different size lines of dots.

```
150 DEFine PROCedure Dotted_Line(x1,y1,x2,y2,w,l)
160 LOCal x3,y3,d,nl,a,b,xo,yo
170 d  = ((x2-x1)^2 + (y2-y1)^2) ^ .5
180 nl = d / l
190 xo = (x2-x1) / nl / 2
200 yo = (y2-y1) / nl / 2
210 FOR a = 1 TO nl*2 STEP 2
220     FOR b = -w/2 TO w/2
230         x3 = x1 + a * xo - b * yo / 1 / 4
240         y3 = y1 + a * yo + b * xo / 1 / 4
250         LINE x3,y3 TO x3+xo,y3+yo
260     END FOR b
270 END FOR a
280 END DEFine Dotted_Line
290 REMark ************************************
1000 CLS
1010 SCALE £1,100,0,0
1020 Dotted_Line 120,10,10,60,20,10
1030 Dotted_Line 10,100,130,60,10,20
1040 Dotted_Line 130,50,30,10,3,2
1050 Dotted_Line 80,90,70,10,10,2
1060 Dotted_Line 20,50,100,50,6,20
1070 Dotted_Line 30,100,70,10,15,1
1080 Dotted_Line 90,100,10,10,70,10
1090 STOP
```

Smooth Scrolling on Atari

by R Parkes

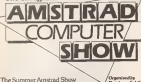
This short routine was written on an Atari 130XE but should also work on any of the XL series It allows the Graphics 0 text screen to be smooth scrolled so is useful for printing out pages of text to a Graphics 0 screen giving a much more professional look

The routine works by poking location 622 with a 1 which sets up a smooth scroll every time the screen is scrolled up a logical line, than all that needs to be done is to alter the display list so as to carry out the smooth scroll, this is done in line 30

```
8 REM SMOOTH SCROLLING
9 REM
10 POKE 622,1:GRAPHICS 0
20 DL=PEEK(560)+256*PEEK(561)
30 POKE DL+3,98:FOR J=6 TO 28:POKE DL+J,
34 NEXT J
35 REM END OF SMOOTH SCROLLING SETUP
36 REM
37 REM EXAMPLE
38 REM TYPE UNDERLINED CHARACTERS IN
INVERSE
39 REM
40 ? CHR$(127); Popular Computing Weekly

50 ? CHR$(127);"POPULAR COMPUTING WEEKLY

60 GOTO 40
```



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Random numbers

G Costello, of London NW3 writes

Q I would like to buy a computer that can generate random numbers in sets of 10 from a range of 1-60, and store them. I need about 1 000 sets I then want to list on screen the three most common numbers What computer could do this for the least cost?

A Since you'll be handling about 10,000 numbers, plus memory overhead for the program you need a computer with at least 16K of free memory This includes just about every computer on the market, with the exception of the C16 and one or two others

So you have no problem in finding a machine although I confess to being intrigued as to why you want to do this In any case the problem is not a difficult one – simply an exercise in loops and array-handling

In rough terms, what you need to do is this set up a two dimensional array say COUNT(10 1000), consecutively fill each element with a random number generated by a statement such as INT (RND(1) * 60) + 1 ten numbers for each set for 1 000 sets

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Atari 520 ST specifications

Roland Given of Brentwood Essex writes

Q I am intending to buy an Atari 520STM and I would be grateful if you could clarify some of the specifications As far as I can tell, the 520STM only displays low-res graphics If this is so, can GEM be run on it without a seperate monitor?

Who exactly will be my local dealer? If Atari means the shop which sells me my machine this could be difficult because I intend to buy mail order

A The 520STM will display its lowest graphics resolution through the TV modulator giving 320 × 200 pixels and 16 colours Gem will work perfectly in this mode so you have no worries there

Neither need you fret about support You should get full co-operation from your nearest dealer regardless of where you actually buy your machine

Copyright procedure

David Fox of Sheffield writes

Q I would like to feature a well-known piece of music in one of my games Do I have to get copyright permission?

A If the music is still in copyright – that is If it's not a traditional piece such as Greensleeves – then they will probably have had to obtain permission to use it In your case, it depends on whether you want to have your programs published If you do, then obtain a copy of the score and write to the publishers requesting permission The best thing to do is to use pieces that are out of copyright. These usually have the word TRAD at the top of the music Or write an original piece

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New Releases

John Cook looks through this week's new arrivals

Amstrad

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Program *Turbo Esprit* **Type** Arcade **Micro** Amstrad **Price** £8 95 **Supplier** Durell Castle Lodge Castle Green, Taunton, Somerset TA1 4AB

Program *The Price of Magik* **Type** Adventure **Micro** Amstrad **Price** £9 95 **Supplier** Level 9 Computing PO Box 39 Weston Super Mare Avon, BS24 9UR

Program *Shadowfire* **Type** Adventure **Micro** Amstrad **Price** £8 95 **Supplier** Beyond Wellington House 6-9 Upper St Martins Lane London WC2.

Is almost a year since *Shadowfire* was released for the Commodore, then the Spectrum soon afterwards, so obviously someone's been taking their time doing this Amstrad conversion

Never mind, though – for Amstrad strategy addicts who have been straining at the leash waiting for this release it was worth the wait.

For those with short memories the scenario is a futuristic *Mission Impossible*, with you controlling a team of five renegades who are sent on a suicide rescue job, on board the sky fortress Zoff V

Fairly average space opera you might say, but what makes the game special is the way you control the team in fact, the whole game – via a series of icons The whole thing has been faithfully recreated, together with the thumping soundrack

In short better than the Spectrum version only slightly inferior to the original plays like a dream what more do you want?

Program *Toadrunner* **Type** Acrcade Adventure **Micro** Amstrad **Price** £8 95 **Supplier** Ariolasoft UK Long Acre, London WC2

Program *World Cup Carnival* **Type** Arcade **Micro** Amstrad **Price** £8 95 (tape) £14 95 (disc) **Supplier** US Gold Unit 10 The Parkway Industrial Centre, Henage St Birmingham B7

Program *Blackstar* **Type** Adventure **Micro** PCW 8256 **Price** £14 95 **Supplier** CRL, Kings Yd, Carpenter s Rd, London E15

Program SAS Raid **Type** Adventure **Micro** PCW 8256 **Price** £14 95 **Supplier** CRL 9 Kings Yard Carpenter s Rd London E15

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Program *The Price of Magik* **Type** Adventure **Micro** BBC **Price** 9 95 **Supplier** Level 9 Computing PO Box 39, Weston Super Mare, Avon BS24 9UR

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Program *Super Hits* **Type** Compilation **Micro** C16/Plus 4 **Price** £6 95 **Supplier** US Gold Unit 10 The Parkway Industrial Centre, Henage St Birmingham B7

Commodore 64

Program *HMS Atlantis* **Type** Adventure **Micro** Commodore 64 **Price** £1 99 **Supplier** Macmillan Software 4 Little Essex Street London WC2

Program *Speedipen* **Type** Utility **Micro** Commodore 64 **Price** £17 50 (disc) **Supplier** JCL Software, 1, Sheffield Road Southbrorough Tunbridge Wells, Kent.

Program *Saboteur* **Type** Arcade **Micro** Commodore 64 **Price** £8 95 **Supplier** Durell Castle Lodge Castle Green, Taunton, Somerset TA1 4AB

Thwunk! Your knife hits a guard in the neck. Thwack! You drop-kick another guard and the computer master plan is yours Just set the bomb defeat the other hundred guards avoid being savaged by the vicious dobermanns, clamber across the roof into your helicopter and away before the time runs out

Another successful mission for *Saboteur* Durell's conversion for the 64 of it's Spectrum hit. Yes it's violent but jolly good fun too – where so many games tried and failed, *Saboteur* delivers the goods Buy it!

Program *World Cup Carnival* **Type** Arcade **Micro** Commodore 64 **Price** £9 95 (tape) £14 95 (disc) **Supplier** US Gold Unit 10 Parkway Industrial Centre, Heneage St Birmingham B7

All the signs are there The panic buying of lager potato munchies and caffeine tablets David Coleman has just gone in for his 1 400 day service People are humming *Land of Hope and Glory* on the Fenchurch St line It can only mean one thing It s World Cup time again

And to make it official, *World Cup Carnival* has just arrived in the office

This is an impressive package – glossy full colour World Cup facts poster, glossy full colour World Cup league table together with adhesive World Cup flags World Cup supporters badge and a free competition to win games or a compact disc Phew!

Oh and there's this com-

Pick of the week

Splitting Images

Program *Splitting Images* **Type** Arcade Strategy **Machine** Spectrum **Price** £7 95 **Supplier** Domark 204 Worple Road Wimbledon London SW20 8PN

One day the man that brought 'the jigsaw into the computer age (that s what it says on the press release, believe me) will be hailed as a far-sighted visionary of a new era One day the leaders of East and West will hold hands skip round the White House lawns make daisy chains and proclaim war is a bad thing I thought as I read said release

Until that time arrives, I will continue to treat any new Domark release with trepidation What will they think of next, eh?

I'll tell you what – it s called *Splitting Images* – you know after that wacky TV program *Spitting Images* Wizard prang The kids will love it.

Yes Domark has released a game very loosely connected with the series that has just come off air

All will be forgiven if the game is any good And it is possibly one of the best I ve played this year so far The Dutch programming team Ernisoft has come up with one hell of a brainstormer

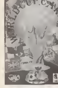
Essentially it s just solving a sliding block puzzle against time but there are some great touches You must solve a 5 by 4 puzzle on a 5 by 5 grid You start off with an empty frame, and release pieces one by one from a hidden stack on the top right (all movement is under multi-colour cursor control) But not all pieces released are puzzle pieces – and by clever manipulation of these strange objects vast bonuses can be gained like colliding a dripping tap with a bomb but if you don't get the bomb off screen within a few seconds you re in trouble

The *Spitting images* connection is that the completed screen images comprise famous figures Ronnie Maggie Sir Clive, etc

Forget the hype and don't think twice about the price – this one really is worth it

puter game as well Remember Artic s *World Cup*? It has to be said that *World Cup Carnival* is not going to be anything new to you if you already have the Artic version A few frills have been added but the gamesplay is the same as are the major graphics and sprites A good enough game in its time, but it does look a bit dated now

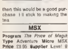
If you are football mad already seething with sporting patriotism, like stickers and desperately want to play computer games during half time



then this would be a good purchase I ll stick to making the tea

MSX

Program *The Price of Magik* **Type** Adventure **Micro** MSX **Price** £9 95 **Supplier** Level 9 Computing PO Boc 39 Weston Super Mare Avon BS24 9UR



PCW 8256

Program *Blackstar* **Type** Adventure **Micro** PCW 8256 **Price** 14 95 **Supplier** CRL 9 Kings Yard, Carpenter s Rd London E15

Program *SAS Raid* **Type** Adventure **Micro** PCW 8256 **Price** £14 95 **Supplier** CRL, 9 Kings Yard Carpenter s Rd, London E15

Spectrum

Program *World Cup Carnival* **Type** Arcade **Micro** Spectrum **Price** £9 95 **Supplier** US Gold Unit 10 The Parkway Industrial Centre Henage St, Birmingham B7

Program *Outworld* **Type** Strategy **Micro** Spectrum **Price** £1 99 **Supplier** Durome Software Victoria House 5 Vicarage Rd Bradwell Village, Milton Keynes Bucks MK13 9AQ

Program *Podder* **Type** Arcade **Micro** Spectrum **Price** £1 99 **Supplier** Central Solutions 500 Chesham House 150 Regent St London W1

Program *A Trick of the Tale* **Type** Arcade **Micro** Spectrum **Price** £1 99 **Supplier** Central Solutions, 500 Chesham House, 150 Regent St, London W1

Program *Toadrunner* **Type** Arcade/Adventure **Micro** Spectrum **Price** £7 95 **Supplier** Ariolasoft UK Long Acre London WC2

I ve got to admit that *Toadrunner* is a pretty good name for a game – almost in the same league as *Attack of the Killer Tomatoes* in fact – but if you re expecting a souped up version of *Frogger*, then you d be in for a surprise, as *Toadrunner* is a new arcade adventure from Ariolasoft

No American import this but a thoroughly home grown product written by David Harper who those with a good memory will remember wrote *Riddlers Den*, which also featured an amphibian in the starring role

Here, your task is to hop around the 60-odd screens discover the Stone Heart, destroy it, then get a kiss from a princess which will transform you into a prince (Haven t I heard all this somewhere before?)

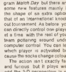
Both the Amstrad and Spectrum versions are really quite good The maze like plan-view graphics are distinctive and give the whole thing something of a fairytale atmosphere

The puzzles vary in difficulty from simple logic (magnets attract metal objects) to the more lateral thinking types (to get past the Gorgon for instance will require some mythological background knowledge plus a sharp nose for puns while other problems simply require a eye for detail

Fans of this type of game are unlikely to be disappointed apart from the price tag Every game of this sort must be compared to *Spellbound* – that excellent Mastertronic title That was £2 99 this one is considerably more

Not the best value in town then but if you re an arcade adventurer with royal aspirations webbed feet and eight quid or so to spend this one s for you

Program *The Price of Magik* **Type** Adventure **Micro** Spectrum **Price** £9 95 **Supplier** Level 9 Computing PO Box 39 Weston Super Mare Avon BS24 9UR



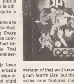
Program *Laser Basic* **Type** Utility **Micro** Spectrum **Price** £14 95 **Supplier** Ocean IQ 6 Central St Manchester M2
Program *Laser Compiler* **Type** Utility **Micro** Spectrum **Price** £9 95 **Supplier** Ocean IQ 6 Central St Manchester M2

Program *World Cup Carnival* **Type** Arcade **Micro** Spectrum **Price** £9 95 **Supplier** US Gold Unit 10, The Parkway Industrial Centre, Henage St Birmingham B7

Program *International Match Day* **Type** Arcade **Micro** Spectrum 128 **Price** £9 95 **Supplier** Ocean Software 6 Central Street Manchester M2 5NS

More football – this time from those software giants Ocean – and it's for the Spectrum 128 too

Not surprisingly, *International Match Day* is a revamped



version of that well known program *Match Day* but there are some new features mainly in the shape of an extra option, that of an international knockout tournament As before you can directly control one player at a time with the rest of your team pottering around under computer control You can tell which player is activated because the socks change colour

The action isn t exactly fast and furious but it plays well and the 3-D perspective is effective enough

What the game does have is a host of options – would that Bobby Robson had this many

Colours can be changed team names can be changed (alas Crystal Palace blew out to Spain 7-0) controls can be changed, handicaps can be set difficulty altered No shortage of variety here Brian

General opinion has it that this is the best of its type for the Spectrum so if you feel the need for a football game on your 128 then look no further



Program *Adventure Game Pack Vol 2* **Type** Adventure **Micro** Spectrum **Price** £6 95 **Supplier** Central Solutions, 500 Chesham House, 150 Regent St, London W1

Charts

Top Twenty

1	(1)	Thrust *(C64)*	**Firebird**
2	(5)	Formula One Simulator *(Various)*	**Mastertronic**
3	(6)	Kik Start *(Spectrum, C64, C16)*	**Mastertronic**
4	(7)	Commando *(Various)*	**Elite**
5	(11)	Batman *(Spectrum, Amstrad)*	**Ocean**
6	(2)	Spindizzy *(Spectrum, C64, Amstrad)*	**Electric Dreams**
7	(6)	International Karate *(Spectrum, C64,)*	**System 3**
8	(–)	Rock 'n Wrestle *(Sp, C64, Ams)*	**Melbourne House**
9	(10)	Bomb Jack *(Spectrum, C64, Amstrad)*	**Elite**
10	(11)	Spellbound *(Spectrum, C64, Amstrad)*	**Mastertronic**
11	(6)	They Sold (2) *(Spectrum, C64, Amstrad)*	**Mastertronic**
12	(13)	Way of the Tiger *(Spectrum, Amstrad, MSX)*	**Gremlin**
13	(–)	Comp Hits 10 Vol 2 *(Various)*	**Beau Jolly**
14	(9)	Vegas Jackpot *(Various)*	**Mastertronic**
15	(–)	Saboteur *(Spectrum, C64 Amstrad)*	**Durell**
16	(20)	Last V8 *(C64, Amstrad Atari)*	**Mastertronic**
17	(16)	Bounder *(Spectrum, C64, Amstrad, Atari)*	**Gremlin**
18	(19)	V *(Spectrum, C64)*	**Ocean**
19	(–)	Action Biker *(Spectrum, C64, C16, Atari)*	**Mastertronic**
20	(17)	Turbo Esprit *(Spectrum, Amstrad)*	**Durell**

Thrust stays at no 1

Kik Start up to no 3

Top Tens

All figures compiled by Gallup/Microscope

Amstrad

1	(1)	Get Dexter	(PSS)
2	(–)	Winter Games	(Epyx/US Gold)
3	(5)	Commando	(Elite)
4	(10)	Last V8	(Mastertronic)
5	(6)	They Sold (2)	(Hit Squad)
6	(2)	Spindizzy	(Electric Dreams)
7	(3)	Batman	(Ocean)
8	(–)	Way of the Tiger	(Gremlin)
9	(–)	Comp Hits 10 (10)	(Beau Jolly)
10	(8)	Into Oblivion	(Mastertronic)

Commodore 64

1	(–)	Thrust	(Firebird)
2	(2)	Int Karate	(System 3)
3	(3)	Spindizzy	(Electric Dreams)
4	(5)	Spellbound	(Mastertronic)
5	(6)	PSI 5 Trading Company	(US Gold)
6	(–)	Biggles	(Mirrorsoft)
7	(4)	F1 Simulator	(Mastertronic)
8	(–)	Rock n Wrestle	(Melbourne Hse)
9	(–)	Saboteur	(Durell)
10	(–)	Golf	(Ariolasoft)

Atari

1	(1)	Vegas Jackpot	(Mastertronic)
2	(7)	Action Biker	(Mastertronic)
3	(4)	Last V8	(Mastertronic)
4	(2)	New York City	(Americana)
5	(6)	Ollies Follies	(Americana)
6	(8)	Fighter Pilot	(Digital)
7	(5)	Shamus	(Americana)
8	(5)	One Man	(Mastertronic)
9	(3)	Scooter	(Americana)
10	(–)	Arcade Classics	(Datasoft)

BBC

1	(1)	Commando	(Elite)
2	(2)	Winter Olympics	(Tynesoft)
3	(4)	Tennis	(Bugbyte)
4	(8)	Karate Combat	(Superior)
5	(–)	Phantom Combat	(Doctor Soft)
6	(–)	Citadel	(Superior)
7	(3)	Bruce Lee	(US Gold)
8	(–)	Jack Attack	(Bugbyte)
9	(–)	Repton 2	(Superior)
10	(–)	Combat Lynx	(Durell)

Spectrum

1	(–)	Batman	(Ocean)
2	(5)	Starstrike 2	(Realtime)
3	(–)	Rock n Wrestle	(Melbourne Hse)
4	(2)	Green Beret	(Imagine)
5	(7)	Way Of The Tiger	(Gremlin)
6	(8)	Fireman	(Mastertronic)
7	(9)	Hvy On The Magik	(Gargoyle)
8	(–)	Turbo Esprit	(Durell)
9	(5)	Bomb Jack	(Elite)
10	(–)	V	(Ocean)

NEXT WEEK

SPECIAL SUPPLEMENT

● Making music

Next week's Popular supplement turns to music-making on your micro

If you've always wanted to write and play music on your computer, you'll need this supplement

Next week we'll be looking at a wide range of musical offerings on a number of machines

● Plus . . .

Mark Jenkins begins a new regular column on the musical potential of micros

● Languages

Tired of the limitations of Basic? Frustrated by machine code? Try something new a new series on computer languages begins next week with the currently fashionable C

The series will also feature a number of special offers to enable you to get going and tackle a new language

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